FEBRUARY 1960

ROCK PRODUCTS

Plan ahead to get big contracts

page 94

Still ANOTHER Cottrell Advancement By Western Precipitation...

UNIQUE "FULL-RANGE" RAPPER CONTROL PROVIDES ENTIRELY NEW STANDARDS OF VERSATILITY

Rapping Frequency... Rapping Intensity... Rapping Pattern
ALL EASILY ADJUSTABLE TO MEET OPERATING REQUIREMENTS

THE PROBLEM:

In the operation of Cottrell Precipitators it is necessary to remove the dust, fume or fly ash that has collected on the plates and cause it to be deposited in a hopper for subsequent removal from the Precipitator. The Rapping System should accomplish this removal with minimum disturbance to the already collected material (to avoid re-entrainment) and with maximum cleaning of the plates.

However, collected materials vary widely in their physical characteristics. Some are sticky. Some agglomerate readily and in thick layers without disrupting electrical operation. Still others have no tendency whatever to agglomerate, but form a sheet of loose particles on the plate.

There is no "typical" dust—no fixed set of conditions to be met. Yet the Rapper System must be readily adaptable to efficient dust removal, regardless of dust characteristics!

Above: Inside view showing unitized circuitry
Left: Unit with dust-tight doors closed

THE SOLUTION:

With so many variables to be compensated, unusually wide adjustability of the Rapper System has long been a prime objective for optimum operating efficiency. But complex factors have prevented its attainment until development of Western Precipitation's new "Full Range" Rapper Control.

By simply adjusting a few dials, "Full Range" Control permits:

- **FULL FREQUENCY ADJUSTMENT**
  from a complete rapping cycle every 50 seconds to one every 3½ hours... or any desired cycle in between!
- **FULL INTENSITY ADJUSTMENT**
  from zero to maximum over an unusually wide range!
- **FULL PATTERN ADJUSTMENT**
  2, 4 or 8 impacts per cycle can be selected, with each cycle varying from light to heavy on successive impacts within the cycle—all automatically controlled to a choice of pre-selected operating limits!

Other Important Advantages...

Greater Safety: The "Full Range" Control has no dangerous high voltage circuits to endanger personnel. Entire unit is in "low-voltage" category.

All "Passive" Design: There are no motors, gears, or other high maintenance components in the "Full Range" Control. It is completely electronic.

Space-Saving Compactness: The "Full Range" Control requires about *half* the space of previous designs. Also is water and dust tight—can be located virtually anywhere.

Unitized Circuitry: All related parts are unitized into separate "cans" for simplified maintenance.

Free! **NEW BROCHURE**
which describes and illustrates the new "Full Range" Rapper Control—the latest product of Western Precipitation's program of continuous advancement!

For quick assistance, call or wire collect our nearest office.

A-M-101

COTTRELL Electrical Precipitators
MULTICLONE Mechanical Collectors
CMP Combination Units
DUALAIRE Jet-Cleaned Filters
THERM-O-FLEX Hi-Temp Filters
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B.F.Goodrich

Oily bricks ride on Koroseal

THAT conveyor belt collects soft bricks from a cutting machine and brings them to the inspection area. The perfect bricks are then stacked for firing in a kiln, the rejects go back for reshaping. But finding a belt that could keep this production line moving was a problem. The bricks are heavily coated with diesel oil. This plus abrasive brick dust plus moisture ruined ordinary belts almost at once.

Various kinds of canvas and rubber belts were tried. But the oil would soak into the belt, blister the rubber, rot the fabric. When a B.F.Goodrich distributor heard of the problem, he suggested a belt made of Koroseal flexible material.

This B.F.Goodrich belt defies the stuff that ruins other belts—oil, grease, chemicals, most acids, alkalies. The Koroseal cover is tough, resists abrasion, cracking, peeling, never gets soft or sticky.

At last report the B.F.Goodrich Koroseal belt had been in service seven months (longer than any belt used previously), and showed no sign of wear or deterioration. In the meantime, the Koroseal belt has helped the plant step up production to an average of 38,000 bricks a day, made substantial savings in maintenance and labor costs.

Your B.F.Goodrich distributor has the exact specifications for the Koroseal belt described here. And as a factory-trained specialist in rubber products, he can answer your questions about the many products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Company, Department M-786, Akron 18, Ohio.*

Koroseal—T.M. Reg. U.S. Pat. Off.

B.F.Goodrich *industrial products*

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ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 63, No. 2

February 1960

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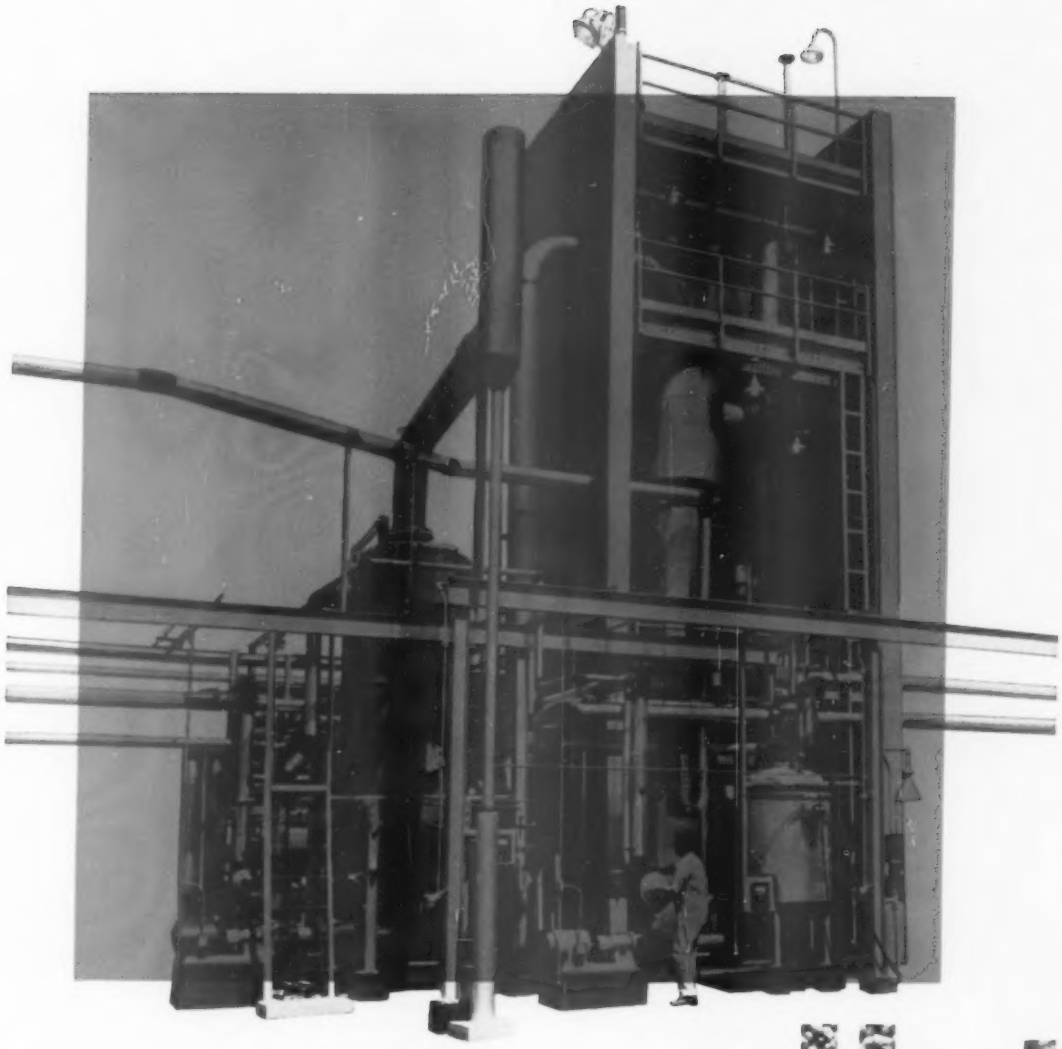

Now Ammonium Nitrate in pellets

New $5,000,000 Atlas Plant
Produces Unique, Improved Blasting Agent

Atlas is now producing low cost Ammonium Nitrate in a new pelleted form designed especially for blasting. Atlas Pellets give oil absorption equal to prills, and flow freely for fast loading into all types of blast holes. The new blasting agent is being made in the new $5 million Atlas acid and ammonium nitrate plant near Joplin, Mo.

Not a granule, not a prill, Atlas Pellets are porous but compact particles which, when oiled, have both the density and sensitivity required for efficient low cost ammonium nitrate blasting. They are the latest advance in developing new products and techniques to help the user of explosives gain lowest possible blasting costs. Your Atlas representative can help you put these products and techniques to profitable use in your operation.

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WILMINGTON 99, DELAWARE
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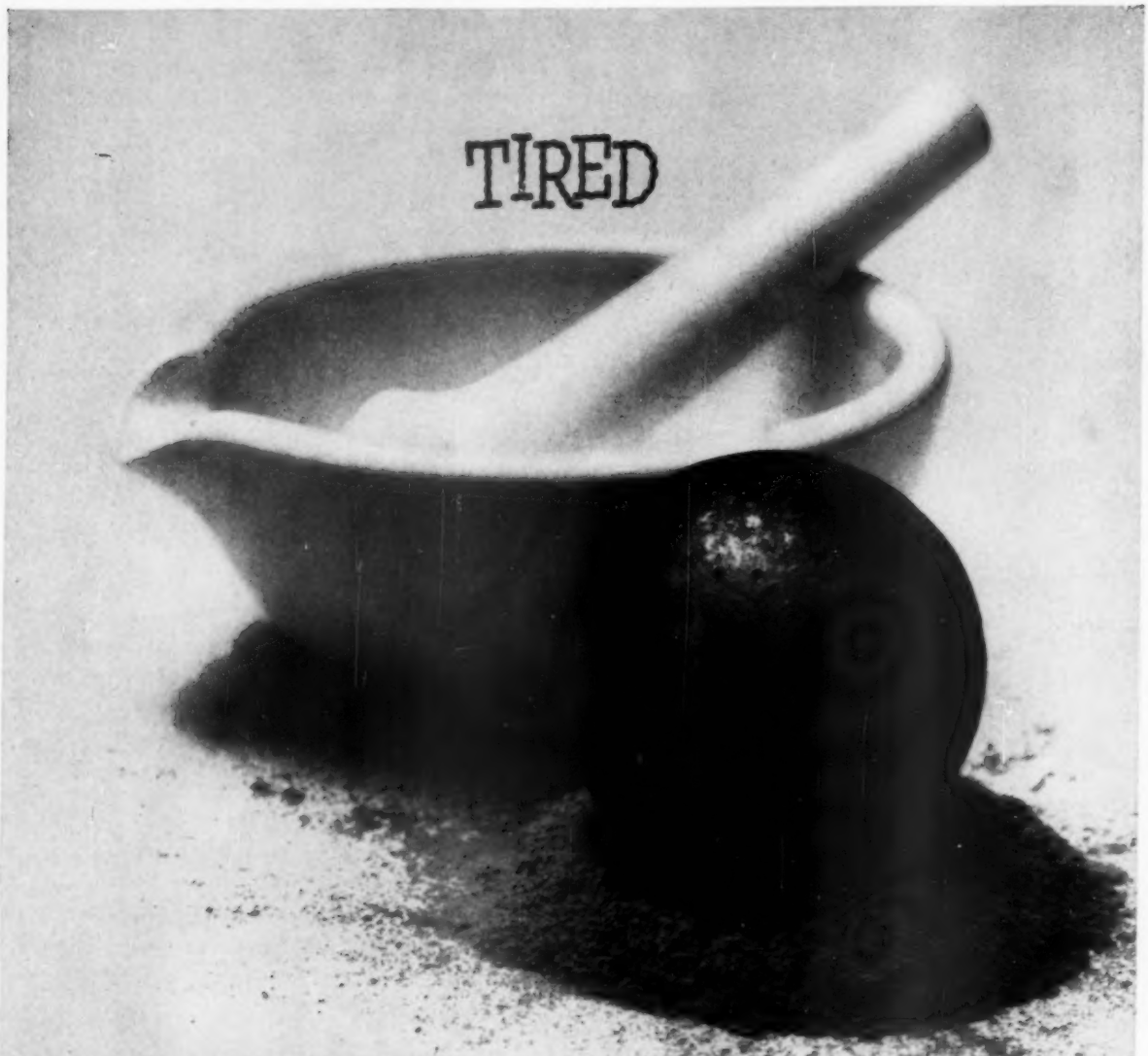

TIRED OF THE SAME OLD GRIND?

Do a better job with added efficiency and economy with Coates Triple-Forged Carbex Grinding Balls. Production run tests show that job for job and dollar for dollar, Coates out-performs grinding balls costing many times more.

Coates Grinding Balls grind better, last longer and wear more evenly because they are carefully made of special formula fine-grained, high-carbon steel, checked and calibrated to be more perfectly round . . . scientifically heat treated to the very core, to be tough and rugged.

Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear.

Write for prices . . . All sizes—½″ to 5″ carried in stock for immediate shipment.

CB59-1

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GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

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Cheney Gravel Co. handles sand to stock pile.

TWO MORE NORTHWESTS FOR MICHIGAN GRAVEL PRODUCERS

Grand Rapids Gravel Co. loading out material from the pit.

NEED A BIG ONE? These big Northwest Draglines may be the answer to your pit problems, wet or dry! Two more Northwests have gone into sizable, well-equipped, well-operated gravel and sand producing operations in Michigan. Grand Rapids Gravel Company at Grand Rapids, is excavating material from the pit. Cheney Gravel Company, at Holt, is using their Northwest on stock-piling.

These big Northwests are fast and they are always ready to go—*we hear it everywhere and Northwest users will tell you so.* They maneuver easily in close quarters, around bins and stock piles. Uniform Pressure Swing Clutches with their smooth operation and freedom from grabs and jerks handle long booms, so often necessary in a wet pit, and eliminate the whipping that makes spotting to hoppers difficult. The "Feather-Touch" Clutch Control brings the true feel of the load and gives ease of operation without resorting to pumps, valves, compressors and other delicate mechanisms. Cast Steel Machinery Bases and Machinery Side Frames, the Cushion Clutch, and many other advantages have proved themselves profitable for the gravel and sand producers many times over.

If you are planning on new equipment of this type, let a Northwest man bring you up to date on the size machine you need.

NORTHWEST ENGINEERING COMPANY

1514 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

Ask about the NORTHWEST 25-D 3/4-yd!

Be sure to find out about the 25-D and the 25-D 18-ton Lifting Crane —New Independent High Speed Worm Boom Hoist, True Power Load Lowering, Longer, Wider Crawlers, Larger Drums and Greater Cable Capacity, Larger Drum Brakes and Clutches and many other advantages.

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Always Ready to GO

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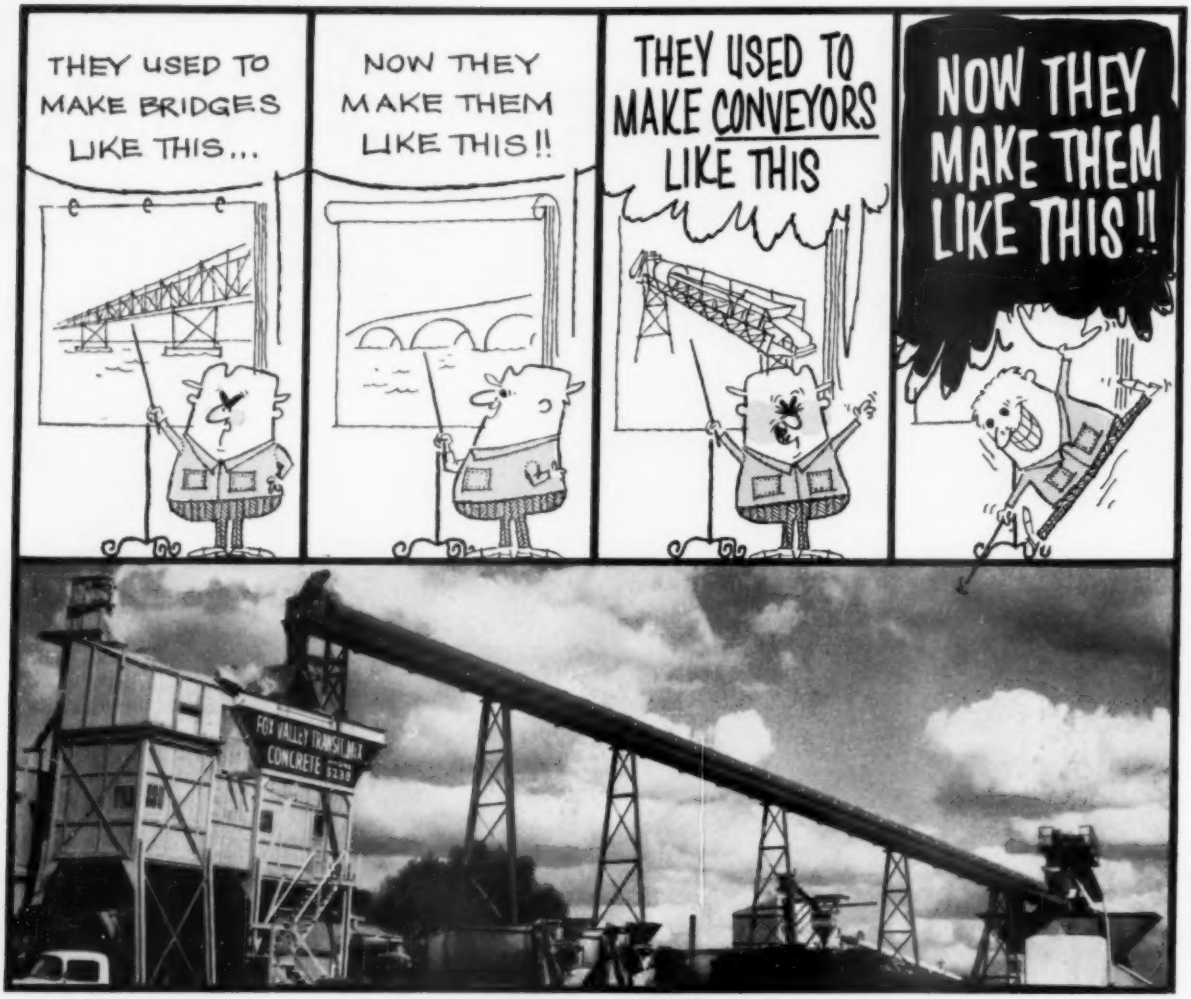
5-86-93-S


THEY USED TO MAKE BRIDGES LIKE THIS...
NOW THEY MAKE THEM LIKE THIS!!
THEY USED TO MAKE CONVEYORS LIKE THIS
NOW THEY MAKE THEM LIKE THIS!!
FOX VALLEY TRANSMIX CONCRETE

STEPHENS-ADAMSON

SECTIONAL BELT CONVEYOR

FEATURING BENT PLATE DECKING

The exclusive STEPHENS-ADAMSON Bent Plate Decking feature provides a new concept in simplicity in conveyor erection. Four high-strength bolts fasten head assembly — eight bolts join intermediate sections — and six bolts connect tail assembly — for simplest and easiest installation ever. Bent Plate Decking affords protection for return run of belt. S-A Sectional Belt Conveyors are competitively priced.

The STEPHENS-ADAMSON Sectional Belt Conveyor combines quality conveyor components and features provided in no other pre-engineered conveyor in the low cost field.

Find out today why the advantages of the STEPHENS-ADAMSON Sectional Belt Conveyor featuring Bent Plate Decking make other types of pre-engineered conveyors obsolete.

WRITE FOR BULLETIN 458

S-A
ENGINEERED BULK HANDLING SYSTEMS
MATERIALS HANDLING PRODUCTS
SPEEDWALK® PASSENGER CONVEYORS
SPHEROL® BEARINGS & ROD ENDS

AVAILABLE IN 18", 20", 24", 30" and 36" WIDTH CONVEYORS — DELIVERED FROM STOCK

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
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PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
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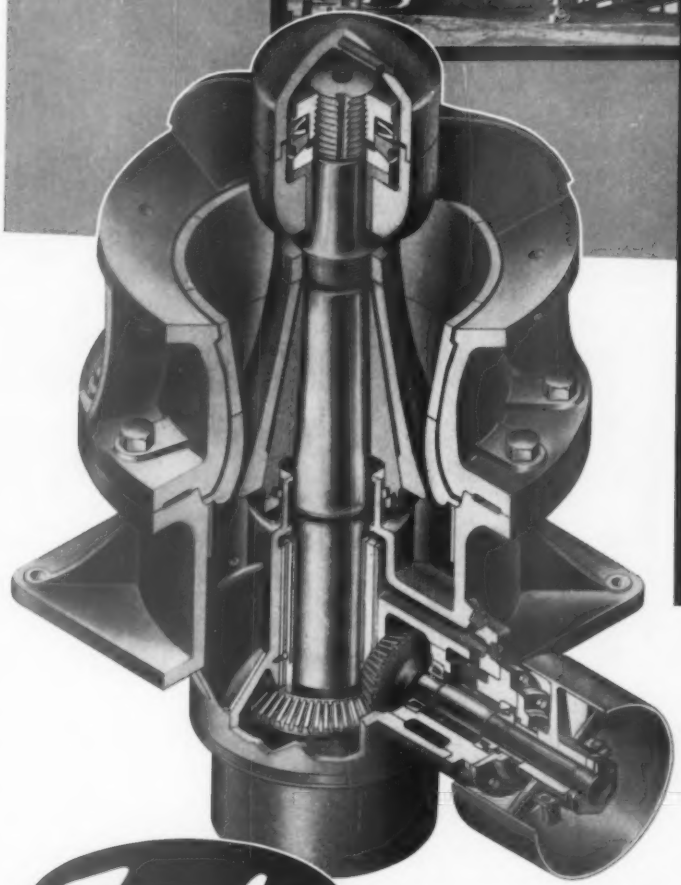
type TY gyratory crusher

for secondary reduction

Shown at left is a 3'-0" Traylor Crusher in a rock and gravel producing plant. Above - 2'-4" TY Crusher in operation at sand and gravel plant.



Traylor TY Secondary Crushers feature many original Traylor developments. Among them are the famous self-tightening bell head, curved concaves of manganese steel, and the patented Traylor dust seal that excludes dust and grit from the lubrication chamber. You buy many outstanding features when you buy Traylor — famous the world over for fine crushing machinery. Write for Bulletin No. 8112 today!

Visit us at Booth No. 56 at the CRUSHED STONE SHOW— Feb. 22 thru 24 Conrad Hilton, Chicago

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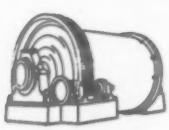

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PRIMARY GYRATORY CRUSHERS

JAW CRUSHERS

SECONDARY GYRATORY CRUSHERS

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The New Earth-Mover

Especially designed by Goodyear for today's high-powered earth-moving equipment

As you know, today's earth-movers move bigger loads faster than ever before.

To meet the added burden imposed on rims, Goodyear has developed a complete new line of Earth-Mover Rims that are now 40% stronger – yet add an average of only 6% to rim weight.

With Goodyear Earth-Mover Rims you enjoy such additional benefits as a heavy-duty bead seat band driver – to prevent slipping under severest operating conditions. And you get the positive air seal provided by Goodyear's famous Tru-Seal principle.

Goodyear makes rims in widths up to 37" and diameters up to 49". To prevent premature tire and rim failure, it pays to buy and specify rims job-fitted by Goodyear. See your local rim distributor, or write: Goodyear, Metal Products Division, Akron 16, Ohio.

Send for Free Goodyear Rim Catalog

–84 pages of facts and pictures on Goodyear's complete line of rims for every type of vehicle.

Tru-Seal – T. M. The Godyear Tire & Rubber Company, Akron, Ohio

Rim

Only Goodyear Rims have *Bond-A-Coat Finish,* for lasting protection against rust and corrosion.

Buy and Specify RIMS by

GOODYEAR

MORE TONS ARE CARRIED ON GOODYEAR RIMS THAN ON ANY OTHER KIND

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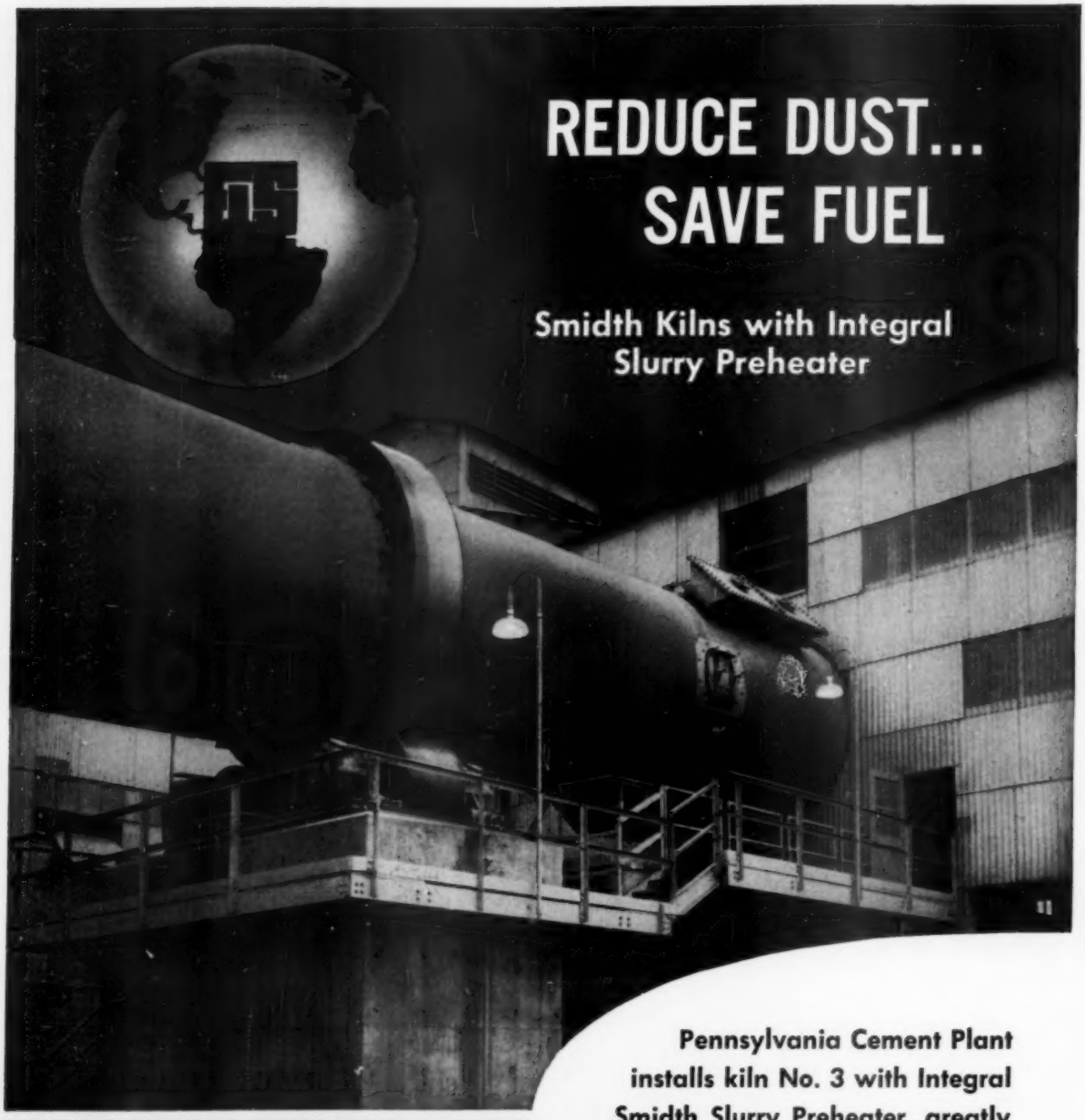
REDUCE DUST... SAVE FUEL

Smidth Kilns with Integral Slurry Preheater



Pennsylvania Cement Plant installs kiln No. 3 with Integral Smidth Slurry Preheater, greatly reducing dust loss and fuel consumption.

Smidth

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WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

February, 1960

A Russian has devised a method of classifying aggregates mechanically based on resiliency and mass. In a portable plant designed by N. K. Timchenko, material is carried from a hopper by a vibrating belt and is fed onto an electrically driven drum revolving at 203 rpm. The stronger, more resilient material rebounds from the drum and is collected separately from the less resilient, weaker material which is carried forward by the movement of the drum to the reject funnel. Road Abstracts contains results of tests and a diagram of the apparatus in operation. The efficiency of the plant, it is said, is impaired if there is a large proportion of weak material, or if there is more than six percent moisture content.

Hot foamed asphalt shows great promise as a binder for wet, cold or substandard aggregates. "Screenings" from the Soil Research Laboratory at Iowa State University reports that acceptable roads have been built using aglime fines, mixtures of sand and loess. Foamed asphalt has also been used to stabilize soils in place. Test roads have been made stabilizing cinders and clay, gravel and a silty loess and blow-sand mixture.

First practical geothermal power in this country may be the 12,500 kw. generating station now under construction. Pacific Gas & Electric Co. has designed a power plant in California to take natural steam from wells and pipe it to turbines. The utility hopes that enough natural steam can be found in the neighborhood to expand the plant to 100,000 kw. eventually. Even these relatively small amounts of power interest the utility since the cost of producing electricity in this way is about one-tenth that of a conventional generating system. Large-volume natural steam sources are near population centers in Italy, Japan, New Zealand and Mexico, and several of these countries have well-developed geothermal generating systems.

High-grade iron can now be made directly from ore. Republic Steel's newly developed R-N process yields iron briquettes suitable for making into steel in electric furnace or open hearth. Prime advantages of the process are its use of low-grade ores and marginal coals and elimination of the blast furnace as a part of the process. Republic researchers have taken the process one step further by processing iron powder directly into finished steel products. Highly refined powder is molded into final form—bars, angles or strip—then sintered and rerolled. In this way it is hoped that complex shapes can be fabricated directly, eliminating the use of open hearths, soaking pits, ingot mills and other intermediate operations in the lengthy conventional processing.

More details are available on those solid gasoline bricks announced by the Russians. In a Russian periodical, the bricks are described as a hardened emulsion. Tiny gasoline drops are encased in plastic which forms a skin around each drop and makes them stick together without mixing. The bricks contain 95 percent of gasoline by volume. They can be burned like lumps of coal and, because they are waterproof, they can be dumped in the sea to serve as a marine fuel supply. Or, they can be pressed back to liquid gasoline by a special machine connected to an engine crankshaft, so that only the amount of gasoline needed to operate the engine will be liquified. They say the quality is the same after reliquification, and only two to three percent of volume is lost.

America's superhighways were models for Italy's Autostrada del Sole—"Road of the Sun." This 450-mile turnpike, the first in Italy, is expected to be finished by June. Cost has been estimated at more than $400 million. Acting as visiting firemen, members of American Bridge, Tunnel and Turnpike Association inspected the road. They observed that the Italian highway has a much narrower right-of-way than most American turnpikes, but the shoulders are wider to accommodate slow-moving vehicles. Pavements are asphalt, and bridges are of prestressed concrete.

Space has a down-to-earth meaning for the organizers of Space Structures, Inc. This new firm is marketing a bubble building which is more permanent than it sounds at first. They inflate a reinforced polyester plastic bubble to the size and shape desired, then spray it for permanency with a compound composed of fibers, cement, glass and clay. Windows and doors are cut into the building after it hardens. Costing about $1.75 per sq. ft., the space structures are noncorrosive, chemical resistant and unaffected by temperature extremes.

Tool steel can be carved like butter, a Chicago inventor has discovered. Dr. L. A. Williams showed off an electrolytic tool that penetrated 1-in. thick steel at about ¼ of an inch a minute, producing a mirror-smooth surface. This was done with a non-consumable electrode and an electrolytic solution. First industrial application for this tool will probably be to make small, intricate parts from high specification steels without burning, hardening, or distorting them.

This highway program is in real trouble. The difficulties of the Federal Interstate Highway Program are insignificant compared with the frustrations of the Inter-American Highway, comments the Wall Street Journal. This 3,000-mile length of road stretches from Texas to Panama, with the United States chipping in more than half of its $250 million cost. However, it seems to fall apart as fast as new construction can add to it. Tortuous mountain passes, tropical jungles and treacherous rivers made the initial construction difficult. The unexpectedly heavy traffic added to these natural hazards has made maintenance difficult, costly and, at some seasons of the year, virtually impossible. But the U. S. Bureau of Public Roads, which is supervising construction, still hopes that construction can be completed and open the full length by 1961, maintenance, politics and finances permitting.

BRADLEY HERCULES MILLS

HOW TO INCREASE CEMENT PRODUCTION UP TO 50%...

The capacity of an existing tube or compartment mill can be increased up to 50% or even higher simply by installing a Bradley Hercules Mill as a preliminary pulverizer on either the dry raw or finish side. Yet this increased production of cement raw material or finished cement is obtained at no increase in horsepower consumption per ton or barrel produced. The Hercules automatic electrical feed control eliminates manual operation. Rugged construction . . . dustless operation . . . easy accessibility to grinding parts keep maintenance costs at an absolute minimum. That's why so many in the cement industry rely on the Hercules Mill for increased production of finished material.

See Chemical Engineering Catalog or
for complete information, write for Catalog No. 63

BRADLEY PULVERIZER CO. LONDON ALLENTOWN, PA. BOSTON

superior grinding equipment since 1891

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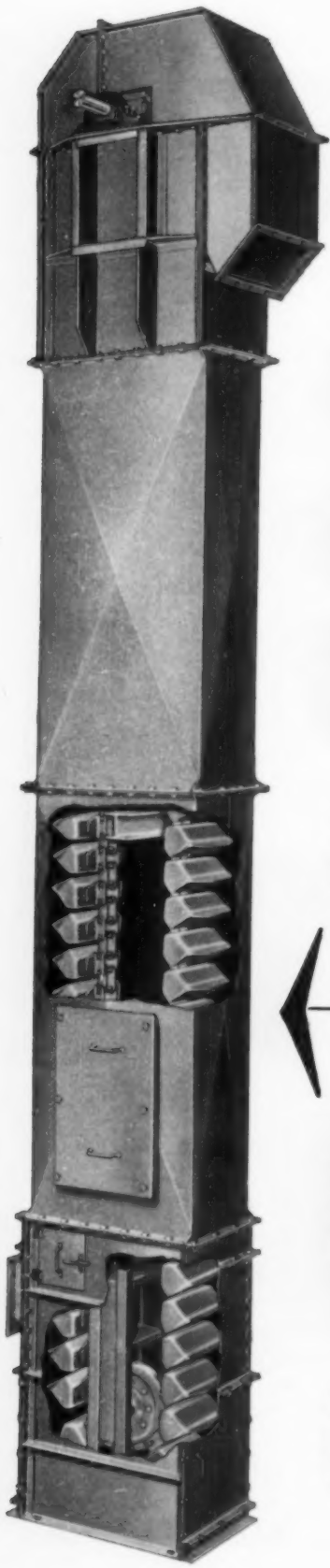
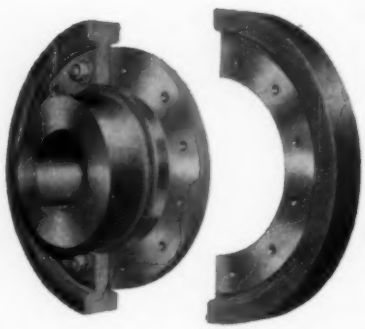


Link-Belt's NEW Type 14

a bear for wear with high capacity

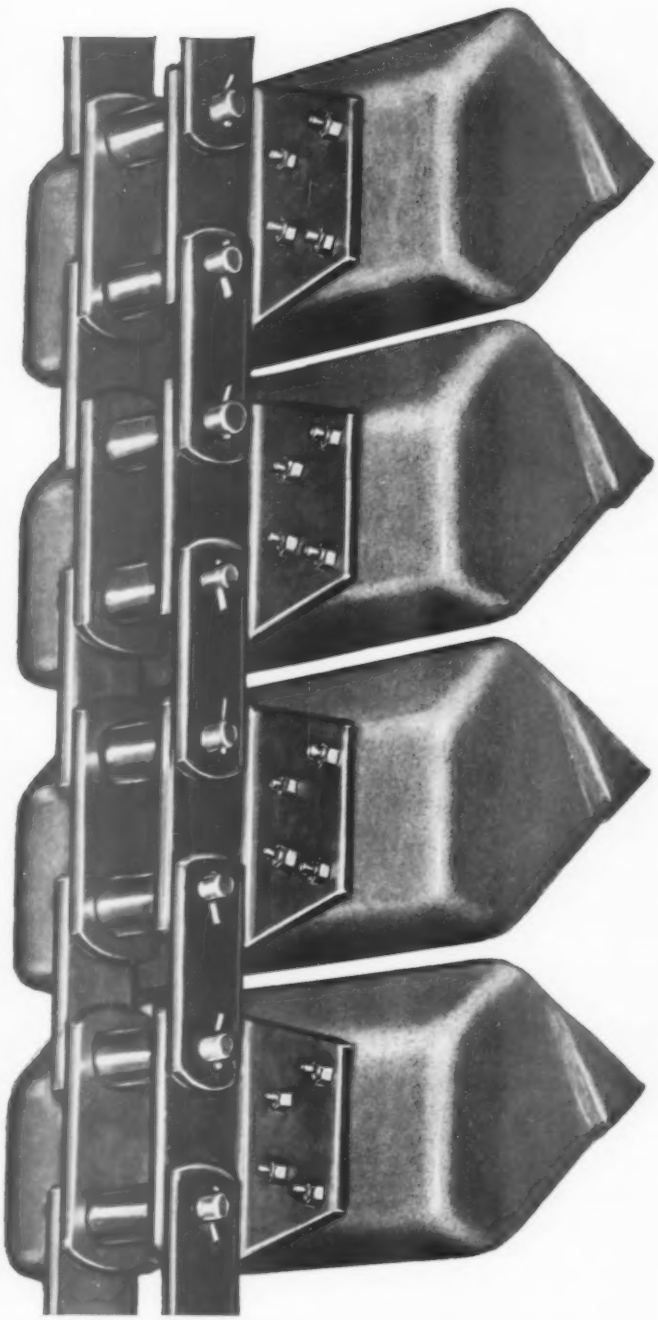
STRONG, RUGGED, EASY TO MAINTAIN—Entire casing of Type 14 is jig-welded, dust-tight, self-supporting construction. Casing hood and intermediate sections of 10-gauge steel; boot section of ¼" plate. Each section has access doors for easy assembly, inspection and maintenance.

LONG-LASTING BUCKETS AND CHAINS—New Style AC elevator buckets of malleable iron or Promal resist abrasive wear and rust. High front increases capacity. Famous Link-Belt SS bushed chain has sidebars of selected steel, machined for accurate pitch and tight fit of pins and bushings. Alloy steel, heat-treated pins and case-hardened bushings resist wear from joint articulation and sprocket contact.



TOUGH RIM SEGMENTS on both sprocket and traction wheel are made of cast steel, heat-treated for added strength and wear resistance. Hubs are gray iron. Segments are machine finished on both sides so they may be reversed to give additional service when one side becomes worn. Rim segments are simply unbolted, turned around, and replaced without removing chain, buckets, hubs, bearings or shafts.

Cement Mill Bucket Elevator...



Durable components contribute to years of dependable service

Handles the toughest abrasive materials like cement, clinker, crushed stone and similar materials—and comes out none the worse for wear! It's Link-Belt's new Type 14 centrifugal discharge bucket elevator—capable of continuous service at greater capacities than any other in its class.

Constant rough treatment is effectively resisted by 10-gauge steel casings. In addition, this elevator features jig-welded, dust-tight construction; buckets of malleable iron or Promal; single-strand SS bushed chain made entirely of tough steel with hardened joint parts. Close spacing of buckets with high front design results in maximum elevator capacity.

A full range of sizes to meet the demands of unusual as well as normal conditions. For complete information, call your nearby Link-Belt district sales office. Or write direct for a copy of Book 2714.

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BUCKET ELEVATORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses and District Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

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EDITORIAL

by GEORGE C LINDSAY

No accidents by 1975?

THE ROCK QUARRYING INDUSTRY SHOULD BE ACCIDENT FREE in just 27 more years. Its accident-frequency rate should be zero in 1987, if progress in cutting the rate during the 1942-1958 period is continued at the same tempo.

That's a worthwhile thought, even though such projection is merely an exercise in arithmetic. But who can say now that the goal is unreachable—even before 1987?

He didn't come to our conclusion on safety prospects, but John C. Machisak of the federal Bureau of Mines startled safety people with some comparisons of accident data in the quarrying industry. Mr. Machisak told the National Safety Council last October that the cement and lime segments of the rock industry contribute most to holding down the accident frequency rates for quarries. Conversely, the rates for the limestone and trap rock segments, along with sandstone, marble and granite, are above the all-rock rate. Yet, all segments are making progress in reducing frequency rates.

You can read Mr. Machisak's analysis in this issue of ROCK PRODUCTS if you'll turn to page 110.

Since all segments do similar work with similar materials, why the great difference in safety experience? Cement rock had the low accident-frequency rate of 4.0 in 1958. By comparison, trap rock's rate for the same year was more than ten times higher; limestone's rate was nearly nine times higher.

It's theoretically possible that the all-stone industry can reach a zero frequency rate before 1987. Based on continuation of past rates of improvement, the cement industry could reach the goal in 1968; limestone in 1971. A projection shows that trap rock and limestone won't get there until the year 2000—unless safety work is sparked.

An obvious conclusion is that there's much to be done in safety work by the lagging segments of the quarrying industry. Methods and men are available to do the job. Concentrated application of good safety principles and full acceptance of an attitude to take nothing short of complete and constant safety practice should turn the trick.

What's wrong with setting a goal of complete safety in 1975? If some segments of the industry can do it, so can the others.

There's a reason WHY in MacWHYte Wire Rope*

It brings out the best in your equipment!

Just as you use specialized equipment for a particular job, it pays to use the right kind of wire rope designed for that equipment.

All wire rope isn't the same. There are changes in the construction of wire rope . . . which aren't obvious to the eye . . . but can seriously affect the way it will work on your equipment. Because all equipment isn't the same, different types of rope are required because of basic design variations.

With this in mind, you can see the reason "why" Macwhyte offers such a wide variety of wire rope:

* Every foot of wire in Whyte Strand is specially drawn, cold-worked by Macwhyte in their own wire mill. Complete processes — from raw material to finished wire for rope — are under the watchful eyes of Macwhyte metallurgists.

* Special lubrication is available in accordance with the needs of the equipment or the type of service in which the rope will be used. The tenacious lubricants provide just the necessary protection — are unaffected by heat or cold, dry or wet conditions.

* Product engineers determine the exact number, size, and relationship of the wires needed to meet the requirements of your equipment. You're sure of the correct size, strength, and flexibility.

* Entire wire and rope mill operations are concentrated on the making of wire rope in a thousand and one sizes, grades, and types . . . to give you the rope you need.

Result: Whyte Strand wire rope is literally "custom made" for shovel hoist rope, dragline, clamshell crane rope, boom hoist line, dozer rope, scraper rope, contractors' hoist and derrick rope, overhead cranes, cableway excavators, and winch lines. If you'd like to check the type of rope recommended for your equipment, send for bulletin 5702 — free for the asking.

191

MACWHYTE Wire Rope COMPANY

2900 Fourteenth Avenue, Kenosha, Wisconsin, U. S. A.

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ROCKY'S NOTES

by NATHAN C. ROCKWOOD

Sand producer compelled to reestablish competitor

SAND AND GRAVEL PRODUCERS seldom figure in antitrust actions, and a recent example of one has some interesting angles. This is a Federal Trade Commission ruling in the case of the Erie Sand and Gravel Co., Erie, Pa., which in 1955 acquired all the sand and gravel producing and distributing assets of the Kelley Island Lime and Transport Co., Cleveland, Ohio. That left Erie the only considerable producer of lake sand between Buffalo, N.Y., and Sandusky, Ohio. In 1954, before the merger, Erie and the Sandusky division (sand and gravel) of the Kelley Island company produced or marketed over 90 percent of all the lake sand sold in a market covering most of the United States port cities on Lakes Erie and Huron and a belt of inland territory estimated by the FTC examiner to be 12 miles wide.

The Federal Trade Commission Examiner made his decision on December 2, 1958, and this decision was upheld by the Commission which, on October 26, 1959, ordered the Erie company to "divest itself absolutely" of the assets it had acquired through the purchase of the Sandusky division of the Kelley Island company.

Unfortunately for the Erie company the decision does not end there. That part of the Commission's order reads as follows: "The Erie Sand and Gravel Co., through its subsidiaries, officers, directors, agents, representatives and employes, shall divest itself absolutely and in good faith of all assets, properties, rights, leases and privileges acquired in the acquisition by the Erie Sand and Gravel Co. of the assets of the Sandusky division of the Kelley Island company in substantially the same productive capacity as possessed by the former Sandusky division of the Kelley Island company at or about the time of the said acquisition; except that the respondent, Erie Sand and Gravel Co., shall not be required to divest itself of the equivalent of the vessel 'Kelley Island.'"

Presumably most of our readers have some knowledge of the kind of operations conducted by the former Sandusky division of Kelley Island and Erie companies. The equipment required are large lake-going steamship dredges which have to navigate considerable distances from base and stay out in the lake for considerable periods under all kinds of weather conditions. To land, store and distribute their sand cargoes requires extensive dock and material handling facilities. The Erie company acquired three such vessels from Kelley Island. One was sold and replaced by a much larger ship—the one Erie company is allowed to keep.

While there is no dispute that the Erie company had a monopoly of supply on lake sand in the markets served, we do not find anything in the Federal Trade Commission charges that the company abused its power. The sand was produced by the Erie company's wholly-owned subsidiary, the Erie Sand Steamship Co., and was distributed through wholly-owned subsidiaries. The cost of the Sandusky division of Kelley Island company to the Erie company in 1955 was $1,074,309.

Erie company arguments: Naturally the Erie Sand and Gravel Co. did not accept the Examiner's ruling without protest. It appealed to the Commission. At this writing it is not known whether the company will appeal from the Commission's order to the courts or not. In its appeal to the Commission the company argued that when it acquired the Sandusky assets in March 1955, the Sandusky division was not a going concern as the Examiner contended, since no sand and gravel had been produced by it after the previous fall months. The Examiner readily answered this by showing that it was customary and necessary to cease lake sand dredging during the winter months, and that in the prior fall months the Sandusky division had been in active operation.

Hence, it was argued that the discontinuance of

Please turn to page 176

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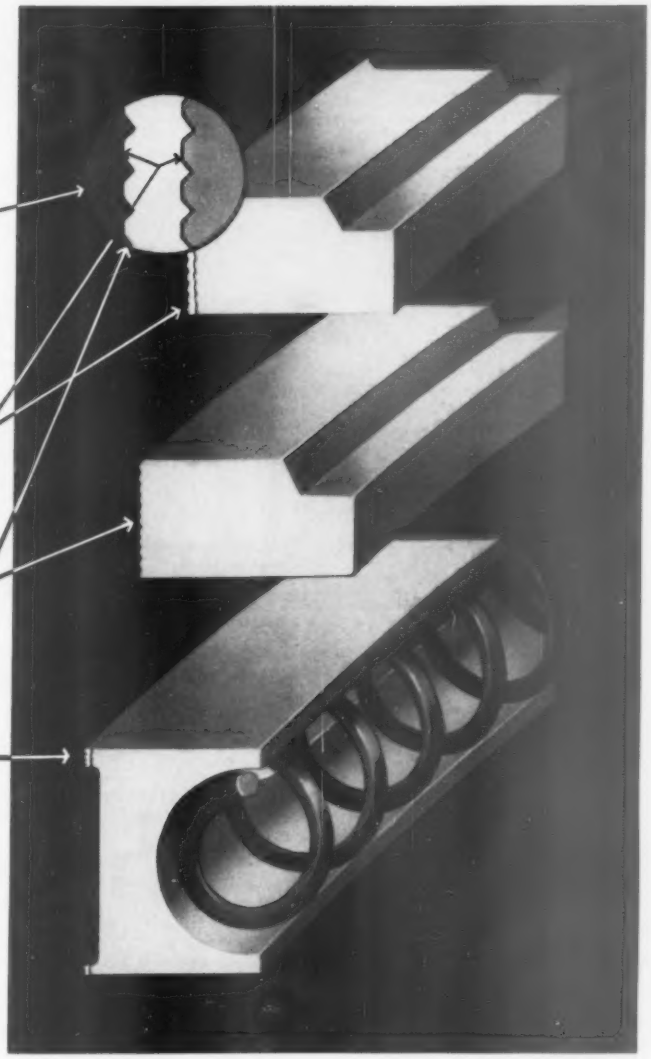

PRECISE CONTROL
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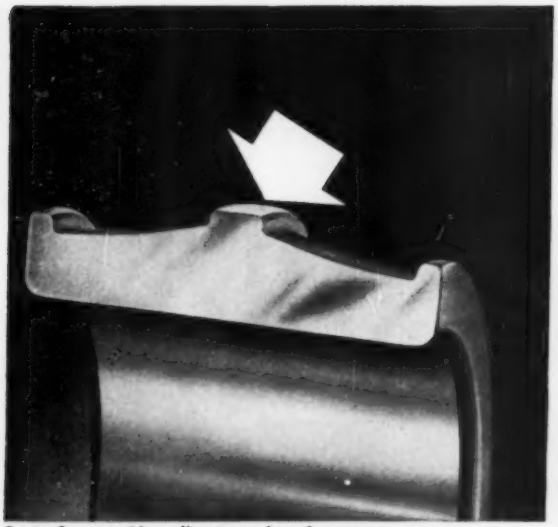
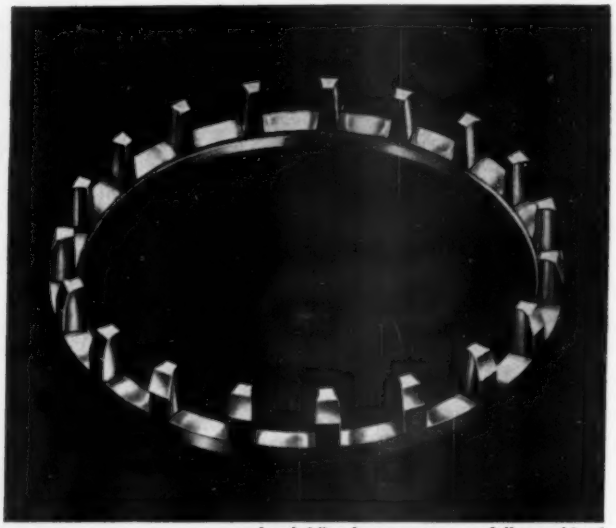
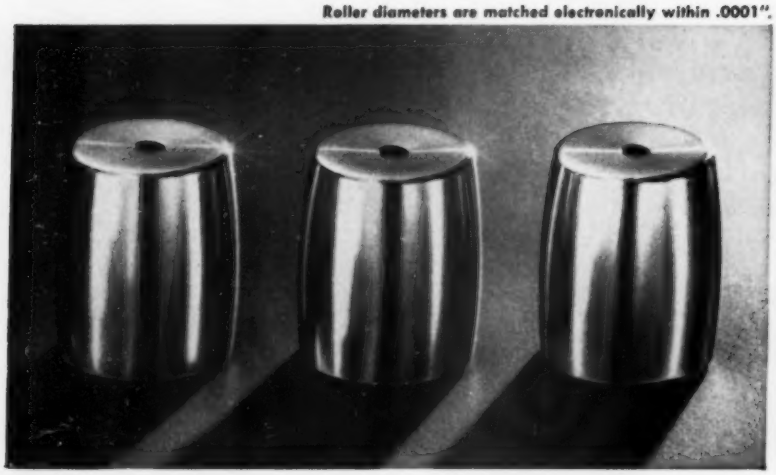


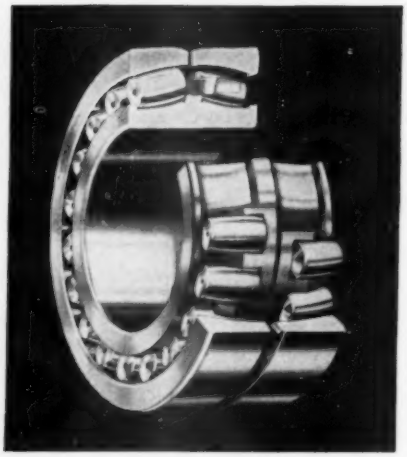
Center flange guides rollers to peak performance.



Land-riding bronze cages are fully machined.

Roller diameters are matched electronically within .0001".





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WASHINGTON LETTER

by EDGAR POE

Car trend Upward President Harold E. Churchill of the Studebaker-Packard Corporation, speaking before the National Press Club in Washington, said:

"The truly fabulous and persistent increase in car production since 1900 shows no signs of leveling off even at the current high rate of 6½ million units annually. Our population is not only growing, but is thoroughly and irretrievably car-addicted and getting even more so. The trend is to two and even three cars per family."

Plan to Broaden Tax base Representative Wilbur D. Mills, ever since he became chairman of the House Ways and Means Committee, has maintained that the only way to reduce individual and corporate taxes is to close loop holes in the existing tax structure.

The capable Arkansan hopes that Congress may close those loop holes and broaden the tax base at the 1960 session. Some longtime Capitol Hill observers believe that Representative Mills will make a stab to get his plan enacted, but there is real skepticism that there will be even a small tax reduction during this session.

What are some of the exemptions that the Committee (all tax measures must begin before House Ways and Means) will consider? The exemption of interest on state and local bond, business expense deductions such as entertainment, depletion allowances, retirement income, and lifting the exempt status of building and loan associations, among several others.

Long range Planning Proposed Hearings are expected to be held by the House Public Works Committee early in the new session on a bill that would create a Public Works Coordinator to promote long-range planning and coordination of public works. Representative John A. Blatnik, Democrat of Minnesota, is sponsoring the bill.

The public works coordinator would collect information from all government agencies concerned with public works. From that information he would, among other things, make recommendations with respect to long range planning of public works. The post of coordinator would be filled by presidential appointment.

Mighty Program Work is underway on nearly 22,000 miles of Federal-aid primary, secondary and urban highways, including 4,900 bridges; this is the biggest program in history. Since Congress passed the Highway Act of 1956, ABC construction contracts have been completed on 88,000 miles and 14,400 bridges at a cost of $5.10 billion.

Age limit Proposal Legislation to remove the minimum age limit for a Social Security disability beneficiary is pending before the House Ways and Means Committee. Existing law prescribes that a disabled person covered by the program be at least 50 years old in order to draw cash benefits. Representative Burr P. Harrison, Democrat of Virginia, maintains that a disabled head of a family, 35 or 40 years old, faces as great a hardship as a 50-year-old person. His proposal would abolish the age requirement.

Technical Employment Roger W. Jones, Civil Service Commission Chairman, advised a House subcommittee that Federal employment increased 12.3 percent between 1947 and 1958. However, he said in scientific and engineering categories employment rose 55 percent from 84,220 to 130,871.

The chairman insisted that Federal pay rates have not been adjusted in accordance with new demands for highly trained personnel. As an example, he said a beginning apprentice in the naval ordnance plant at Charleston, W. Va., is paid $4,742 a year, while an engineer with a college degree may enter the same plant at a salary of only $4,490.

Urban Affairs Section

A division dealing only with urban affairs, because of the growing importance and activity of our fast-growing urban areas, has been set up in the Bureau of Roads. Functions have been divided into three main categories, namely: master plans, highway design and plan analysis.

Under the organization set-up, James L. Shotwell, one of the Bureau's top engineers, said the "Urban Division" intends to keep abreast nationally with new procedures and trends in city planning and design. Subsequently, they will be passed on to the field offices and the state highway departments to aid in the solution of their individual problems.

Mr. Shotwell asserts that the importance of the urban sections of the Interstate System is attested by the fact that nearly 50 percent of the Interstate travel will be on urban sections of the Interstate system, and about the same percentage of revenues earmarked for the Highway Trust Fund will come from urban areas. The mileage of the urban sections, excluding toll roads, accounts for only 4,126 miles of the Interstate system, but these sections represent 42 percent of the estimated cost of constructing the whole system.

Small Town Plants

A study by the Department of Commerce shows that industry is turning more and more to small towns for plant sites. The Department report showed cities and towns with population of less than 50,000 now provide more than 25 percent of all manufacturing jobs.

There is no comparable figure for an earlier period, but Commerce officials expressed confidence that the trend will continue toward locating plants in small towns in the years ahead. An 86-page study, designed to show what type of community an industry is most likely to select for a plant, has been issued.

New labor Hassle Brewing

Representative Phil M. Landrum, Democrat of Georgia, co-author of the Landrum-Griffin bill designed to curb wholesale racketeering and criminal activities in certain labor unions, insists that the 1959 law is merely the beginning.

The Georgia Democrat insists that the big powerful labor unions should be put under anti-trust laws like business is put under such laws. Thus, it could be that another scrap over labor legislation is shaping up before Congress this year.

Meantime, a number of the 229 members of the House of Representatitves that voted to substitute the Landrum-Griffin bill for the milder Kennedy-Ervin bill at the 1959 session have accepted the challenge of one labor leader. James B. Carey, president of the International Union of Electrical Workers affiliated with the AFL-CIO, wrote a letter to each of the 229 members warning that he and his organization were going to try to beat them at the polls in 1960.

Million Increase

Seven states have each chalked up numerical increases of more than 1,000,000 persons since the 1950 decennial census, according to estimates by the Bureau of the Census. California as the leader of the group, which the Census Bureau expects to pass New York by 1970 as the No. 1 state in population, had a net gain of 3,698,000.

The other states were: Florida, a gain of 1,774,000; Texas, 1,613,000; Ohio, 1,587,000; New York, 1,483,000; Michigan, 1,458,000; and Illinois, 1,288,000. New Jersey, Pennsylvania, Indiana, Maryland, Virginia and Wisconsin had increases ranging from 500,000 to 1,000,000.

PHS cites Pollution Causes

Air pollution is evoking more and more interest in both the executive and legislative branches of the Government. A statement of the Public Health Service says cancer of the lung is increasing more rapidly and causing more deaths than any other form of cancer in the adult male population.

Many investigators have indicated cigarette smoking as responsible in large part for the increase. Others contend that increased volumes of automobile exhaust fumes and industrial vapors polluting the air are largely responsible for the causation of lung cancer.

The Public Health Service paper on lung cancer, by Dr. Leroy E. Burney, says among other things: ". . . Air pollution may be the 'urban factor' which would help explain the higher death rate from lung cancer in urban as compared with rural areas. The major sources of air pollution are exhaust products of gasoline and diesel engines, incomplete combustion products of petroleum and coal, many asphalt and bituminous products used in construction and road paving, and certain industrial effluents . . ."

THE ORBIT OF ACCEPTANCE . . .

It's still young enough to be called "new" . . . but the MIKRO-PULSAIRE Collector is actually a veteran that's proving itself on nuisance dust and air pollution control jobs all over the world. If you're looking for assurance of around-the-clock recovery with constant low differential pressure, full-time automatic cleaning and absolute minimum maintenance, you'll find it in the MIKRO-PULSAIRE! It's a simplified unit, as the basic components above will show you . . . and yet it delivers a filtering efficiency of 99.9% plus on a wide variety of harmful or noxious dusts. Engineered for economy, the exclusive Mikro jet-action principle eliminates gears, cams, chains and other high replacement-cost parts inside the housing, and guarantees longer bag life, as well. There's a MIKRO-PULSAIRE for every nuisance dust problem, including new modular construction units with capacities from 20 cfm to any known requirement. Bulletin 52A, which is yours for the asking, tells the complete story.

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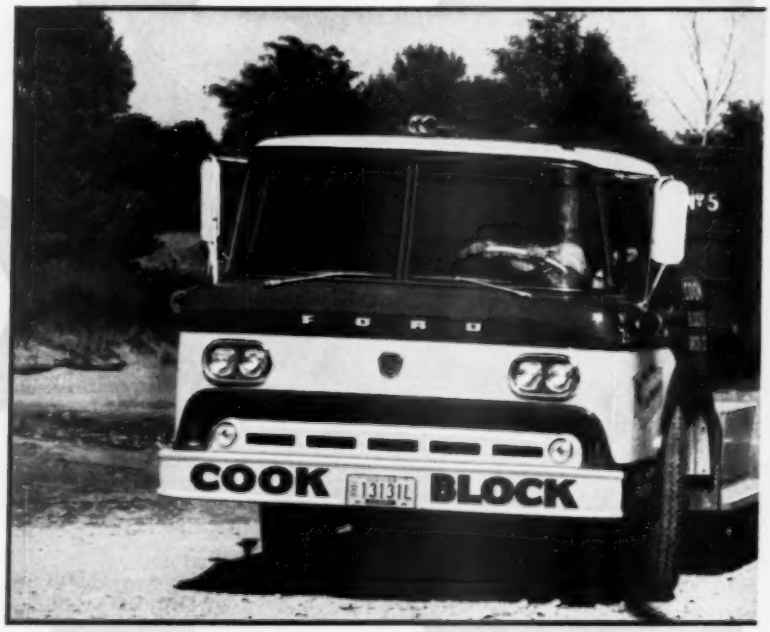
Here's another reason why Ford Trucks are your best buy!

"OF ALL THE MAKES WE'VE TRIED FORD TRUCKS GIVE US THE LOWEST MAINTENANCE COST!"

ANOTHER REPEAT BUYER OF FORD TRUCKS

Virgil E. Cook, owner of Cook Block and Brick Co., is convincing proof that there is still plenty of opportunity in American business for those sound planning, hard working individuals who want to own their own business. Starting from scratch just 13 years ago, he now owns and operates one of the largest concrete products plants in Eastern Indiana. The workhorses in his fleet of 16 trucks are three Ford Tilt Cab Tandems that are used to haul sand and gravel to the plant and make deliveries in and around Anderson.



Hard-working Ford CT-950 tractor leaves Cook gravel pit with 18 yards of aggregate. Aluminum walking beam and rubber suspension system of tandem axle assembly reduce chassis weight, permit higher legal payloads.

Cook's CT-850 with special flat-bed body and Side-O-Matic unloader delivers blocks right to the job site. Unit carries 600 concrete blocks and spots them where needed.

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The FORD TRUCK DISPLAY

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"Our experience has proved that Ford Trucks can be operated at substantially lower maintenance costs than any other make we've tried. And, equally important in a fleet like ours, we find that our Fords spend much less time in the shop. None of the Ford units purchased since 1958 have been in for major repairs and I am still amazed at the way the older ones keep going.

"The best truck we've ever owned is a 1954 Ford C-700 that consistently carries a load of 350 to 400 blocks over all types of terrain. In spite of this severe work it ran 125,000 miles before we replaced the engine. This unit now has over 140,000 miles on the original ring gear and pinion and it went 60,000 miles before we relined the brakes and put in a new clutch. This is outstanding mileage when you consider that we've realized as little as 12,000 miles from competitive ring gear and pinion sets. Clutch and brake life obtained with other makes in identical service was only 20,000 miles. It's results like this that keep our costs low and convinced us that we should stay with Fords when we bought our bigger trucks in '58.

"Our 1958 and 1959 Ford Tilt Cab Tandems give every indication of equalling or surpassing the fine records set by the C-700. The two CT-950 tractors hauling sand and aggregates to our processing plant breeze through traffic and take the hills like they weren't there at all. Our CT-850 equipped with a flat-bed body has the power and traction to deliver finished products anywhere. With Ford's tilt-cab design we get a real plus as far as payload is concerned because we can carry at least 2,000 pounds more weight on the front axle.

"We buy Ford Tilt Cab Trucks because we think they're the best engineered and most modern gasoline trucks in the heavy-duty field. Here at last is a truck built to permit big legal payloads with enough power to move these loads at economical speeds. We pride ourselves on our modern and efficient equipment and consider our Fords one of the most valuable assets of our business."

'60 Fords are built for longer life . . . with Certified Durability!

Whatever your job . . . wherever you do it . . . you'll discover just as Mr. Cook did, that Ford Trucks are the best investment for your transportation dollar.

Certified results of tests conducted by America's leading independent research organization (name available on request) confirm the fact that Ford Super Duties have been refined for still more durability! Automatic radiator shutters, improved electric fuel pumps and redesigned wiring harnesses are typical of the advancements to be found in these units.

Automatic radiator shutters reduced the coolant temperature variation recorded in severe mountain road tests from a 79° range to a 20° range. Engine operation with coolant temperatures in the 167° to 187° range means less expansion and contraction, more efficient combustion and better lubrication . . . all of which contribute to longer engine life.

Dynamometer tests showed *no vapor lock* with Ford's submerged-type electric fuel pump at temperatures up to 200°. Incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under the same conditions. Shaker table tests plus constant exposure to oil, water and heat proved 1960 wiring harness to be *three times longer lived.*

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

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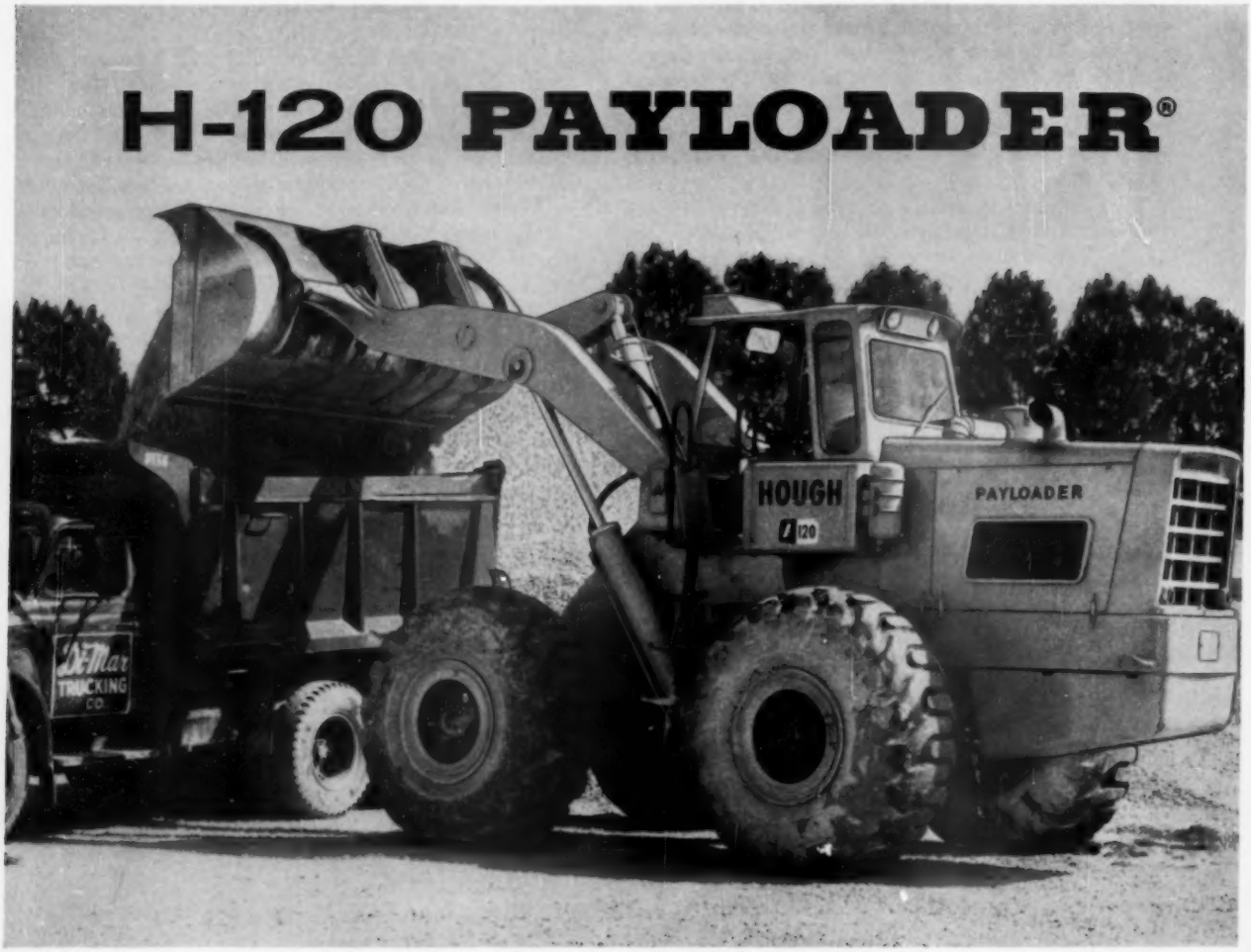
H-120 PAYLOADER®



Long forward reach (3½' from front tires) and high dumping clearance (10'-10" to bucket edge, dumped) enable the H-120 to load any size truck with speed and safety.

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"MUCH, MUCH BETTER THAN ANY OTHER"

says Charles Serianni, President, ASSOCIATED DI-MAR INDUSTRIES

Hollywood Quarries, Inc., a division of the vast, diversified Associated DI-MAR Industries, Hollywood, Florida, is one of the major aggregate producers in the area and has the reputation of "pushing out" materials at breakneck speed. Equipment has to pay its way, or make way for newer, faster, more productive machines.

Several months ago a new H-120 "PAYLOADER" was demonstrated in direct competition with Hollywood's other loaders in the quarry. "There was just no comparison... the H-120 was a much, much better loader than anything we've ever had", said Charles Serianni. "I had to buy the H-120 in order to keep my best operator... he's really in love with it."

One of the other loaders was traded in and now the big "PAYLOADER" does as much work as two 2½ yd. loaders formerly did. Huge 23-ton trailer trucks are loaded with crushed rock or sand in less than 2½ minutes.

The long reach, high dump and full clear, visibility front and rear, makes loading fast, easy and safe. Power assist on all controls — steering, braking and shifting — reduces operator fatigue for sustained steady output all day long.

The H-120 (12,000 lb. operating capacity) is a "wonder on wheels" so it's no wonder why aggregate plants throughout the country are buying them in fleets, and setting new performance records for output and economy. If you haven't seen this remarkable new "PAYLOADER", contact your Hough dealer as soon as possible, or return the coupon for full details.

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

Powerful traction plus tremendous break-out force gets full bucket loads quickly and easily. Bucket tips back 40 degrees at ground level.

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2-B-4

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LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

Should an employe be fired if he files a lawsuit against one of your best customers?

What Happened: A group of maintenance men was assigned to do some repair work at a customer's plant. While they were at work an accident occurred and four of the men were injured—not seriously. They received workmen's compensation for injuries and time lost.

A year and eight months after the accident the four men started a lawsuit against the customer. Each asked $100,000 for personal injuries. A few weeks later the men were fired. The company offered these reasons:

1. The news of the lawsuit appeared in the local papers and was harmful to our reputation.
2. The unfavorable publicity implied that the customer's plant was an unsafe one.
3. The workers showed a lack of proper loyalty.

The employes countered:

1. We didn't cause the unfavorable publicity. The stories about the lawsuit were picked up by the newspapers from court records.
2. We are suing the customer—not our employer. This is not a disloyal act.
3. An employe cannot be fired for taking a legal action. Otherwise employes would be afraid to sue an employer for any kind of wrong.

Were the employes:
Right? ☐ **Wrong?** ☐

What Arbitrator Stowe ruled: "A lawsuit directly against the employer concerning matters arising out of the employment relation is not generally regarded as improper, as evidenced by the fact that legislation has been enacted in which provision is expressly made for the employes to bring suit without fear of employer retaliation—as for example the Fair Labor Standards Act. There is no reason to regard a lawsuit against an employer's customer in any different light. The grievance is sustained and the men should be reinstated to their jobs."

When can't you fire an employe for loafing?

What Happened: The company and the union were in the midst of negotiations. The meetings were private and held on company premises. The situation in the plant was quite tense, and rumors flew thick and fast. On one of those days, the plant manager decided to tour the plant. His particular target was the maintenance department where control records showed that things were not quite up to snuff.

In order to better observe what was going on, he decided not to make his presence known. Instead, he hid behind a pole and took out a notebook to record his observations. He did this for 4 hours. At the end of that time, his notebook showed that Bill Wells had not done a stitch of work. The plant manager called all the workers of the unit together and told them what he had observed and noted down. He then called Bill into his office and read to him the notes he had taken during that time.

"I guess I haven't done any work," Bill admitted. "We're all nervous about those negotiations." Bill was let out for "loafing on the job."

At arbitration, the company stood by Bill's own admission. Bill brought up his work record which was fair, except for a warning slip a year earlier for "clocking out early," and he demanded his job back.

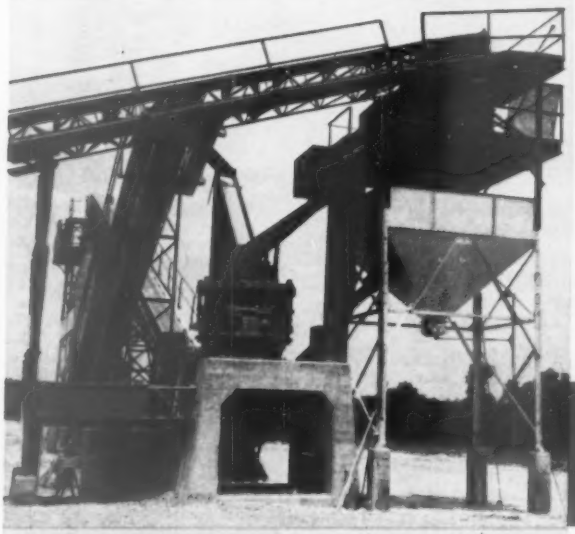
Was Bill:
Right? ☐ **Wrong?** ☐

What Arbitrator Sanders ruled: "The Arbitrator believes that the worker's conduct must be judged in the setting in which it occurred. This setting seems to have been a period of general disturbance and unrest. More importantly, the setting includes an absence of adequate supervision. The worker's conduct does justify discipline. But discharge is too severe under the circumstances. I order reinstatement without back pay."

(Continued on page 30)

Start with A...for Alabama...

Primary Crushing Unit of Hodges & Company plant.



Scalping Screen and Secondary Crusher of the plant.

go through to W for Wyoming —there are Telsmith plants in all the fifty states

Anniston, Alabama, is the location of this modern, Telsmith-equipped quarry plant of Hodges & Company. With its 25 x 36 Telsmith Primary Jaw Crusher, and Telsmith 48-S Gyrasphere Secondary Crusher, production has reached 175 tons per hour making minus 1¼" crusher run. Tonnage is running from 125 to 140 tons per hour when producing minus 1" plus No. 4, and minus No. 4.

TELSMITH EQUIPMENT IN THIS PLANT

36" x 14' Intermediate Duty Apron Feeder • 25 x 36 Roller Bearing Jaw Crusher • 48-S Gyrasphere Secondary Crusher • 4' x 8' Double Deck Vibro-King Screen • 5' x 12' Triple Deck Vibro-King Screen • 30" x 132', 30" x 100', 24" x 81' Telsmith-BG Conveyors • Three Steel Bins with Bin Gates.

Q-39-959

TELSMITH

Send for Bulletin 266.

SMITH ENGINEERING WORKS

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Representatives in Principal Cities in All Parts of the World • **Cable Address: Sengworks, Milwaukee**

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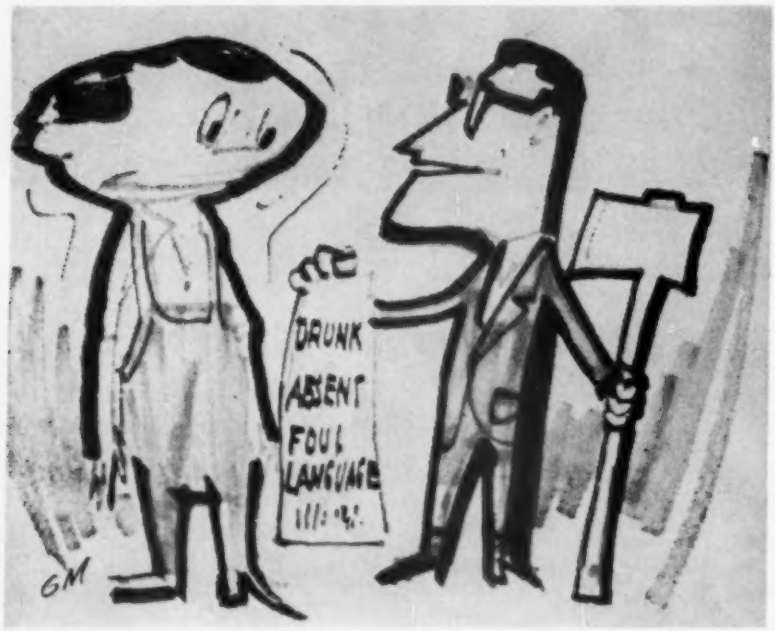
(Continued from page 28)

How much of an employe's past record can be used as a reason for discharge?



What Happened: On his day off, Jim King came knocking on the plant door. The foreman came out and asked him what he wanted. King demanded to see one of the employes.

"I want his car keys. He's got my fishing pole in the back of his car."

The foreman told King to wait—the men were on a rush job. Instead, King went to another entrance, motioned to his buddy and received the keys. When the foreman saw them, he ordered King off the premises. King left, but not before he let loose a trail of abuse and profanity against the supervisor.

The next day he received the following note in his time rack:

"For being on company property unauthorized and refusing to leave as directed and, in the presence of 30 other company employes, using abusive and profane language against the company and myself, you are discharged."

When the case came to arbitration the company took out King's past record to show to the arbitrator. It included:

1. a 5-day layoff for drinking.
2. 7 warning slips for lateness and absenteeism.

"You can't do that," King insisted. "My termination slip says nothing about my past record so you can't bring it up now at the arbitration. The only thing to be decided at this hearing was my behavior the other day. I think discharge is too severe. The foreman goaded me into what I did."

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Belkin ruled: "The question of the use of the employe's past work record by the company in making its determination to discharge him is one which has several ramifications. In the opinion of the Arbitrator it would be inconceivable that the company do anything else. We have here a matter of equity and fairness. In order to be fair, the totality of an employe's record, good or bad, must be weighed. This would certainly be applicable where the record was good. It must also apply where the opposite is true.

"I could not decide this matter if I had no knowledge of an employe's work performance and record. This is a matter of discharge or reinstatement and, thus, transcends the realm of the ordinary grievance. I shall hold, therefore, that despite the wording of the notice, the company may show evidence of the employe's record."

If an employe doesn't show up for 5 days, can he be fired?

What Happened: John Gregg phoned his foreman and said he would be absent. When the foreman asked him "why," John answered, "Oh, some family problems."

"When are you coming in?" the foreman wanted to know.

John replied that he would return to work "just as soon as possible." He didn't show up for 5 days in all, and when he came to work he was told that he was discharged for excessive absenteeism.

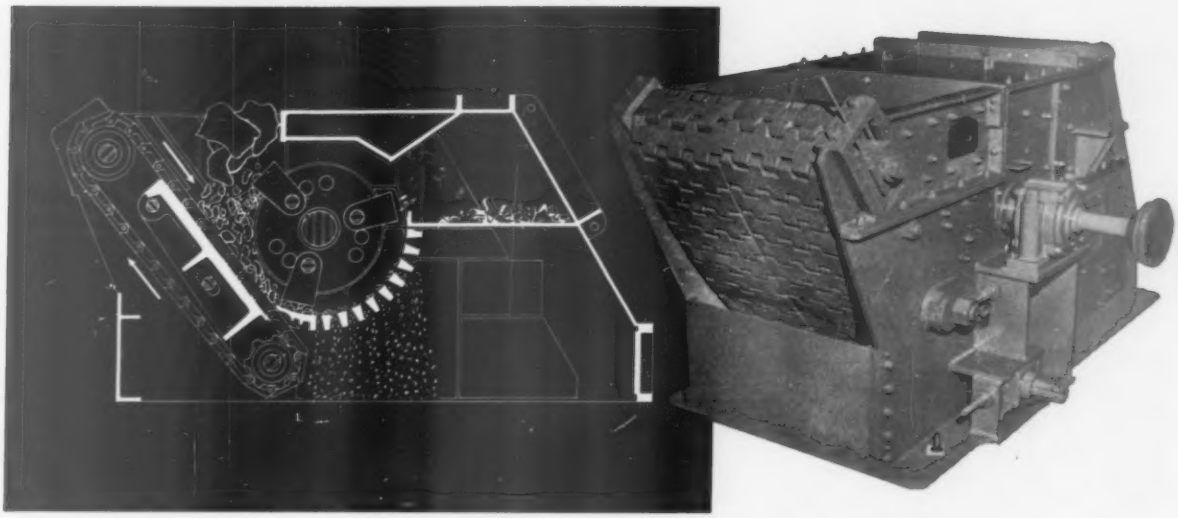
"You can't do this. The company rule says that a worker must notify the company when he expects to be absent. This I did. I'm covered," John argued.

The management didn't budge from its position. It held that:

1. John was out for 5 days. The company rule was that an employe loses his seniority if he is absent for 5 days without notifying the company.
2. A telephone call saying that he would be back as soon as possible was not proper notification.
3. Family trouble was not an acceptable excuse for a 5-day absence.
4. John's absentee record was "bad."

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Sanders ruled: "Management is entitled to make reasonable rules regarding absenteeism and has a right to require that employes give notice of absence. John Gregg had an obligation to call the company after the first day's absence and get approval for additional days off. His failure to let the company know of his return, plus his previous record of excessive absenteeism, do not entitle him to reinstatement. The company's action was justified." **END**



FOR CRUSHING WET AND STICKY MATERIALS

If you're bothered with plugging and time lost getting the mill clear, here's the crusher that'll do away with your troubles. It's the Pennsylvania Non-Clog Hammermill. When in operation the traveling breaker plate carries the feed into the path of the hammers at a fixed rate of speed, making it impossible for the sticky feed to build up on the breaker plate out of reach of the hammers. In extreme wet feed conditions, where frequent clean-outs in the rear of the crusher may be necessary, the Non-Clog can be equipped with a self cleaning device. For complete information on the Pennsylvania Non-Clog Hammermill, send for bulletin 1052. Pennsylvania Crusher Division, Bath Iron Works Corporation, West Chester, Pennsylvania.

Pennsylvania CRUSHERS

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PEOPLE IN THE NEWS

Lewis Rumford II (Fabian Bachrach, photographer)

Standard Lime and Cement announces key appointments

STANDARD LIME AND CEMENT CO., Division of American Marietta Co., with headquarters in Baltimore, Md., has announced these appointments:

Lewis Rumford, II, president; Walter L. Specht, executive vice president; W. D. Garvin, vice president, operations; L. J. Mueller, assistant vice president, operations; W. L. Tribull, vice president, industrial sales; F. J. Troja, vice president, building materials sales; J. A. Kirk, Jr., vice president, traffic.

S. C. Magersupp, secretary-treasurer; G. B. Phillips, general superintendent; J. B. Gillenwater, assistant general superintendent; U. G. Potts, assistant general superintendent; J. R. Harman, Supt. of maintenance; K. D. Simmons, the Martinsburg, W. Va., plant superintendent.

J-M names treasurer

JAMES M. SHACKELFORD has been elected treasurer of Johns-Manville Corp., succeeding Joseph L. Wood who retired this year. Mr. Shackelford was appointed assistant to the treasurer in 1957, after having held the position of controller for the firm's pipe division. A graduate of Washington and Lee University, he did graduate work at the Massachusetts Institute of Technology department of engineering and business administration.

Godfrey wins PR post at Northwestern

KNEELAND A. ("NED") GODFREY, JR., former assistant editor of ROCK PRODUCTS, has assumed the duties of public relations officer for Northwestern University, Evanston, Ill. Mr. Godfrey will cover press relations, a quarterly research report and biweekly newsletter for the Technological Institute and all of the physical science departments.

The byline of the "bright young man" at ROCK PRODUCTS has been well known to readers of such recent features as "How producers are saving money," "Air jig saves beneficiating dollars" and "An industry first: HMS for crushed stone."

A civil engineering graduate of the University of Wisconsin, Madison, Mr. Godfrey completed work on his master of science degree at Northwestern's Medill School of Journalism in 1957. He then joined the Maclean-Hunter Publishing Corp.'s market research department. The move to ROCK PRODUCTS gave him the opportunity to employ both his technical background and his journalistic talents in writing, editing and layout.

Ferguson promoted

WILLIAM C. FERGUSON has been promoted to the post of assistant to the general mechanical and electrical superintendent of New York Trap Rock Corp.

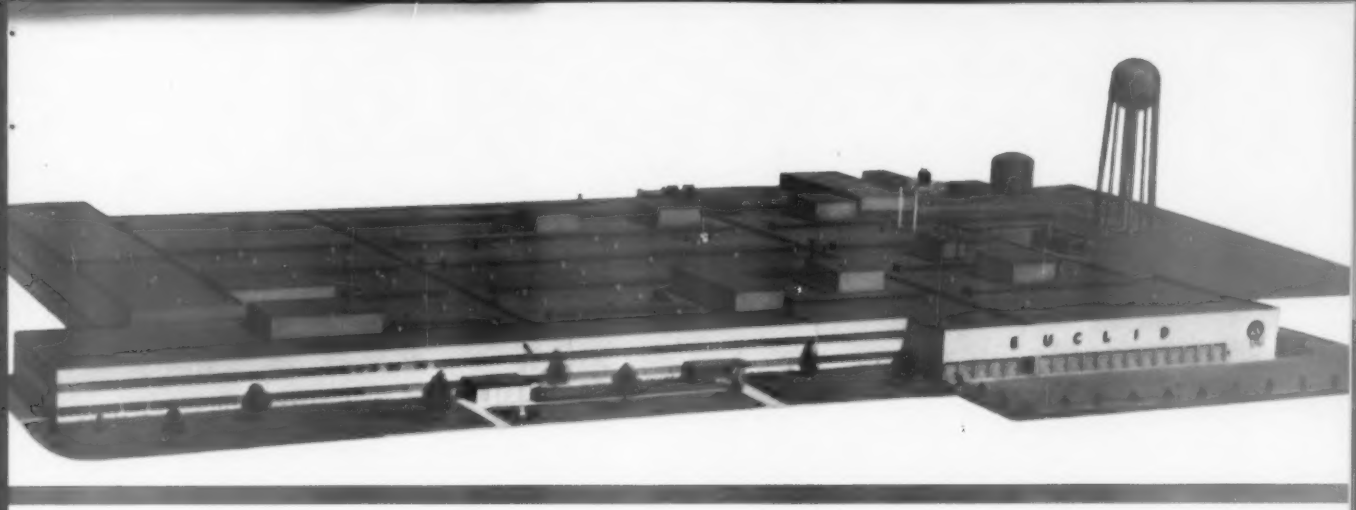
(Continued on page 37)

BIG CRAWLER TRACTOR NEWS FROM EUCLID!

C-6 Crawler now in production at Euclid's new tractor plant

A new concept in crawler tractor design, the Model C-6 is the most recent addition to the modern line of Euclid equipment developed and job proved during the past 5 years. Like the big twin-power TC-12 tractor, as well as 5 new scraper models and 4 new rear-dump haulers, the C-6 has the power, speed and versatility to get more work done faster and at lowest cost. All of these new "Eucs" incorporate years ahead engineering that has been a major factor in maintaining Euclid's leading position in the construction equipment industry for many years.

Now a big modern plant at Hudson, Ohio, designed exclusively for the manufacture of Euclid crawlers, is in production on Model C-6 and TC-12 tractors. Here every facility is provided to assure a uniform high standard of product quality that pays off in dependable long life performance of Euclids on every job.



C-6 sets a new standard in 200 h.p. tractor class

Brand new in every way . . . in functional design, ease of operation, service accessibility and productive capacity . . . but a "veteran" of many thousands of operating hours on a wide range of actual jobs and thorough testing at the proving grounds. No other machine in Euclid's history has ever been so completely proved for productive capacity and long service life before the start of volume production.

With 211 net h.p. and job proved Torqmatic Drive, there's a smooth, steady flow of power to match the work load. Changes from any speed range to another and from forward to reverse and back again, are made under full power . . . there are 3 speed ranges in forward and reverse, with a top speed of 7.9 mph.

Dry type air cleaner, full hydraulic track tensioning, independently suspended track frames and final drives, rear mounted cooling system, fewer lube points, and "package" assembly of major components are some of the other C-6 features that make this "Euc" outstanding for easy servicing and maintenance.

Compare and prove for yourself...

THE "EUC" C-6 IS THE LONG-NEEDED "STEP AHEAD" IN CRAWLER DESIGN

When you check all the things that really count in crawler performance . . . easy operation, maneuverability, power and traction for tough work, and minimum downtime . . . you'll see why the new C-6 is your best investment in the 200 h.p. class. No matter what the job is . . . heavy dozing and ripping, push-loading big scrapers, pulling heavy loads, stripping, land clearing, or handling stockpile assignments . . . the versatile C-6 cuts costs and gets more work done faster.

The Euclid dealer in your area will be glad to show you why the C-6 is your best bet for increased production at lowest overall cost.

EUCLID DIVISION OF GENERAL MOTORS
Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD.
Lanarkshire, Scotland

. . . a complete line of equipment for heavy earthmoving, mining, logging and many industrial operations . . .

Printed in U.S.A.

(Continued from page 32)

Dolbear wins Hardinge Award

SAMUEL H. DOLBEAR, eminent consulting mining engineer and geologist, will receive the Hal Williams Hardinge Award from the American Institute of Mining, Metallurgical and Petroleum Engineers, at their annual meeting in New York, February 14. The citation notes his outstanding services to the industrial minerals industry and his editorial chairmanship of the first two volumes of "Industrial Minerals and Rocks."

Mr. Dolbear is a former consultant to the U. S. Bureau of Mines and lecturer at the University of Southern California. He has been a member of AIME since 1927. His career has encompassed many important posts with major companies and the government. Prominent in the rock industry, he has published many technical papers and holds a number of U. S. and Canadian patents, including 30 on mineral processes and apparatus.

Vice president named at Lone Star Cement Company

W. C. PRIEST FRAZIER has been appointed vice president in charge of sales, succeeding R. J. Mahon, executive vice president, commercial, who is retiring April 1 because of ill health. Mr. Frazier has been sales manager for the firm's Superior Division at Seattle, Wash., since Lone Star acquired the Superior Portland Cement Co. in 1957. He originally joined the company as a sales clerk in 1935.

Mr. Mahon marked his 35th anniversary of service at Lone Star sales last year.

Willis R. Greer will succeed Mr. Priest Frazier as sales manager of the Superior Division.

Hall to head Potash Co.

JOHN W. HALL was elected president of Potash Co. of America, following the resignation and retirement of F. O. Davis. For the last four years, Mr. Hall has served the company as vice president in charge of sales. Previously he was eastern sales manager at New York for Werthan Bag Corp., and spent 16 years in sales, purchasing and plant management with Swift & Company.

(Continued on page 40)

"OUR EAGLE HMS PLANT has solved our chert and soft stone problem"

GILLISSE CONSTRUCTION CO., GRAND RAPIDS, MICH.

To eliminate soft stone and chert from their class B material, to meet Michigan State Highway Dept. specifications, Gillisse Construction Co. uses an Eagle Heavy Media Separation Plant of 50-t.p.h. capacity. Ted Zeeff, Vice Pres., reports "It has solved our chert and soft stone problem. We are pleased with its efficiency and economy. The operator likes its ease of operation."

The Eagle HMS Plant is processing Michigan 6B material (⅜" to 1½") for bridge and overpass construction and 10B (⅜" to 1") for pre-stressed concrete bridge girders. This specification permits only 3% or less of deleterious material. Gravel treated by the Eagle HMS Plant readily meets specs. Sink or beneficiated material runs about 90% and float or rejected material about 10%. Rejected material sold to secondary markets.

The highly efficient O.C.C. separatory vessel used in the Eagle plant makes a float-sink separation on materials with as little as 0.02 difference in specific gravity. If heavy media separation is the answer to your problem, this new high in separating efficiency allows the type of control needed to meet really tough specifications without unnecessary wastage of "good" material.

Gillisse Construction Company, also praises the splendid performance of their Eagle Coarse Material Screw Washer-Dewaterer which processes pea gravel (—⅜"), their Eagle Double Log Washer handling partially crushed gravel, and their Eagle Fine Material Double Screw Washer-Classifier - Dehydrator which handles concrete sand (2NS).

If soft stone or chert is hindering your sales an Eagle HMS Plant can solve your problem. Send for literature.

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EIW

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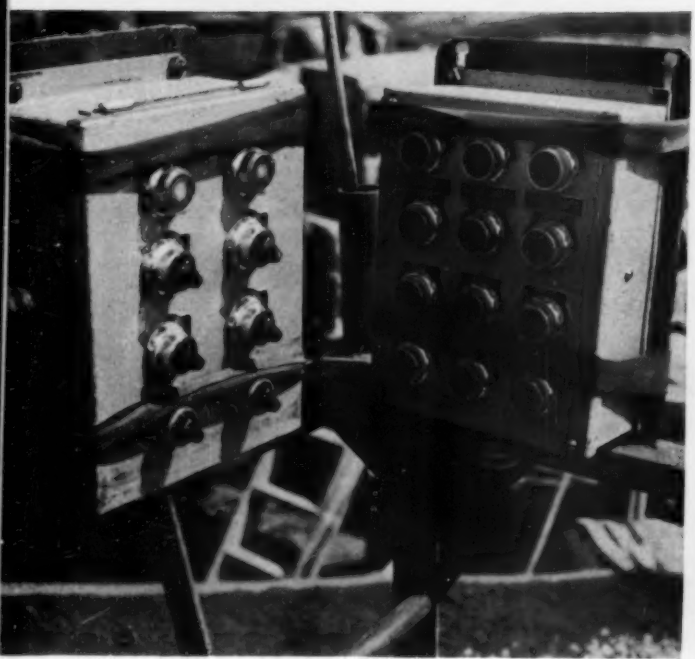
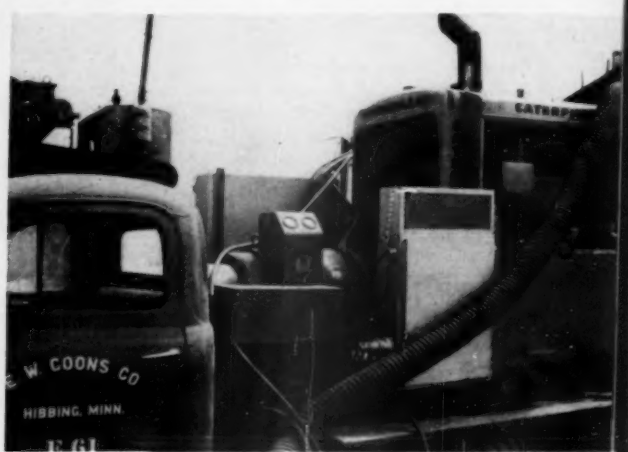
engine power
BY CATERPILLAR



From his post on the control deck, the operator sees each part of the plant. He doesn't have to leave his post to check anything.

Operation of the plant is simply a matter of pressing the right button at the right time. Action is instant. Controls are for feed, crushing and delivery.



How much can you increase production with Cat "Two-Handed" Engines?

"CAT 'TWO-HANDED' D337 INCREASED OUTPUT BY 25%," REPORTS WERNER A. KOSKI, CRUSHER PLANT FOREMAN FOR E. W. COONS CO., INC.

How many more dollars a week would a 25% increase in your plant production mean to you? What value would you place on greater freedom from down time? And increased portability? A much simplified plant?

These are questions to answer when you consider converting from one kind of power—usually mechanical—to Cat "Two-Handed" Engines that give you mechanical and electrical power both. The advantage is this: *one* engine lets you choose the most efficient power for each of a variety of needs.

E. W. Coons Co., Inc., installed a Cat D337 "Two-Handed" Engine in mid-1958. The plant is a Pioneer Two-Unit Crushing and Screening Plant, driven direct through transmission. Power from a 75 KVA generator drives five 20 HP motors on screens and conveyors, as well as an electric welder. Production is 275 tons per hour—a 25% increase over past performance.

The "Two-Handed" Cat D337 is mounted on a truck, which increases portability, particularly for the crusher. Off-plant installation also removes the engine from much dust and vibration.

The operator controls production from a single push-button panel. Feed, crushing and delivery operations are always visible to him and under instant control. He starts and stops the delivery conveyor instantly, which provides an efficient guard against "giving away" aggregate. Variable speed on the conveyor makes it much easier to maintain flow which keeps vibrating screens packed full time, regardless of size, moisture content, or density of screened material.

Now might be an excellent time for you to look at your plant and its power. Check it with an eye to spotting hodgepodges of cross shafts, jack shafts, and other power transmitters. Take a look at your down time records and your fuel consumption costs. Ask yourself, too, just how portable *is* your portable plant? How much production do you miss with your present setup?

Then ask your Caterpillar Dealer to outline the kind of plant you'd have with a Cat "Two-Handed" Engine. He has an engine that will give you direct-from-the-flywheel mechanical drive, with a large-capacity front-mounted generator for your electrical load. He has nine basic Cat Engines up to 700 HP and 350 KW—plus all of the engineering data you need to plan the most profitable installation.

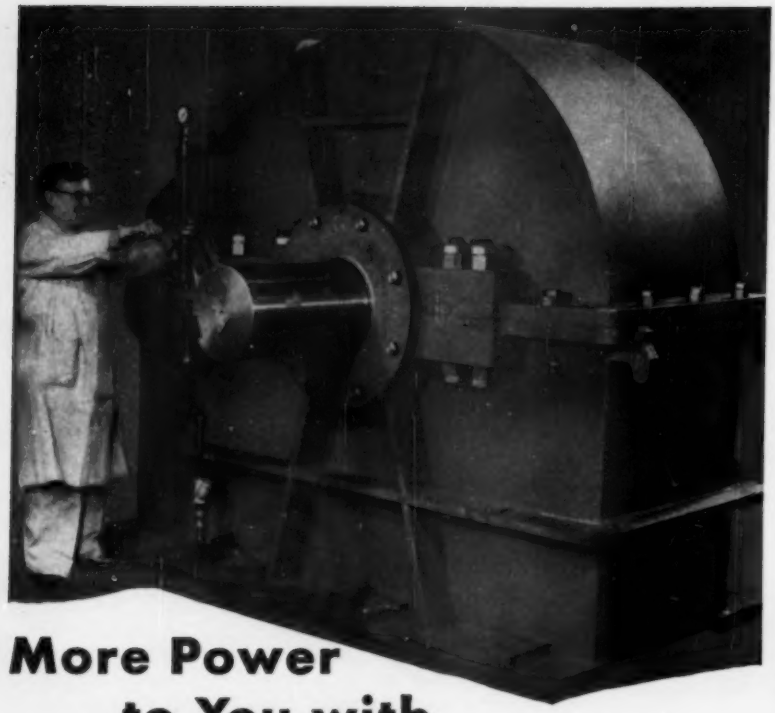
CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

"Two-Handed" Cat D337 is mounted off-plant on a truck. Engine is away from plant vibration and escapes much of the dust. Truck mounting increases plant portability and versatility. This also has the advantage of simplifying over-the-road transportation.

Over-all view shows Pioneer Two-Unit Crushing and Screening Plant of E. W. Coons Co., Hibbing, Minn. In photo, plant is producing several grades of crushed gravel for subbase, shoulders and detours on construction of 10 miles of two-lane concrete paving on North Dakota No. 5 from Langdon to a point 10 miles east.



More Power
to You with

D.O.James

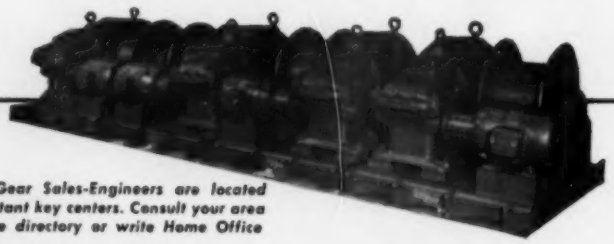
CONTINUOUS-TOOTH HERRINGBONE
GEAR SPEED REDUCERS

The Gear Reducer that's Built-to-take-it—James precision made Herringbone Gear Reducers have been the choice of power transmission designers and engineers for over a half-century. Their proven on-the-job performance—in the steel, coal mining, cement, chemical and other industries—testifies to their operating dependability. Low maintenance costs and the long wearing qualities of the *gears with a backbone* add up to greater efficiency, production and increased profits. James Herringbone Reducers come in all sizes and in a wide horsepower and ratio range, enabling them to handle small and large power transmission installations. Catalog 40-E, containing complete information, is now available. May we send your copy today?

D.O.JAMES GEAR MANUFACTURING CO.

Manufacturers of All Types of Gear Speed Reducing Transmissions and Cut Gears

1140 W. MONROE STREET, CHICAGO, ILLINOIS



James Gear Sales-Engineers are located in important key centers. Consult your area telephone directory or write Home Office

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PEOPLE IN THE NEWS

(Continued from page 37)

Conaway named on two boards

PAUL B. CONAWAY, president of Brewer and Brewer Son, Inc., Chillicothe, Ohio, has been named to the board of directors of two state associations. He was elected to serve permanently on the board of the Ohio Sand and Gravel Association, of which he is a past president. He was elected to a three-year term of trusteeship on the board of the Bituminous Concrete Producers Association, Inc. of Ohio.

Universal Atlas promotes Schwarz

LLOYD L. SCHWARZ has been promoted to sales manager of the St. Louis territory of Universal Atlas Cement Division of U. S. Steel Corp. Mr. Schwarz succeeds W. Troy Gaunt, who is retiring after 35 years of continuous service with the company.

Mr. Schwarz was graduated from Hanover College, Hanover, Ind., in 1948, when he joined the company's Chicago office as a sales trainee. He later worked as a salesman in the Illinois and Wisconsin territory.

Brobston elected to Controllers Institute

SCOTT BROBSTON, treasurer, Nazareth Cement Co., Nazareth, Pa., has been elected to membership in the Controllers Institute of America. Established in 1931, the Institute is a non-profit management organization of controllers and finance officers from all lines of business.

(Continued on page 42)

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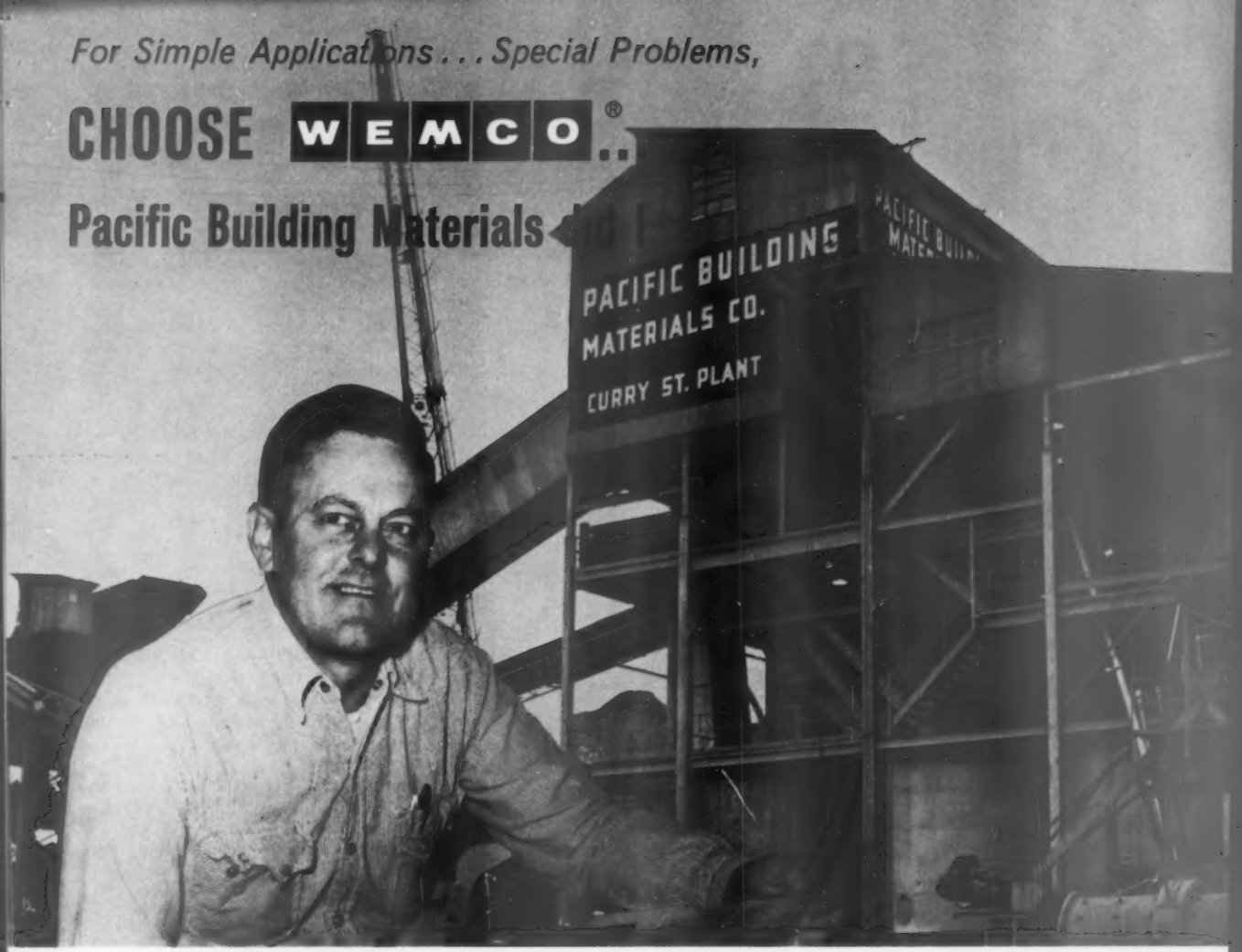
For Simple Applications . . . Special Problems,

CHOOSE WEMCO®..

Pacific Building Materials



Howard Hamlin, Plant Superintendent at Pacific Building Materials Division of Glacier Sand and Gravel Company, Portland, says:

"Our five WEMCO Sand Prep Machines, with their low maintenance and lack of mechanical trouble, play an important part in the over-all efficiency of our Curry Street Plant. Repairs and maintenance on the five machines we have here, plus three at other locations, have totaled less than $100 per year average during their eight years of operation. Per machine, this amounts to less than $12 per year."

The Curry Street Plant of Pacific Building Materials is designed to furnish all sizes and blends of sand required in the Portland area. Treating the varying gradation of sand dredged from the Willamette River requires the utmost in flexibility and efficiency. Only the WEMCO Sand-Prep combines all of these requirements. Part of these outstanding characteristics are: slow spiral speed . . . multiple pitch spirals . . . large and quiescent pool . . . and over-all sturdy design and construction . . . plus L/D*, of course.

Whatever your sand-sizing problems, WEMCO equipment will produce a better end result at lower cost. Why not follow Mr. Hamlin's recommendation and find out more about these products? Your nearest WEMCO representative is fully qualified to give you complete information and assistance in all your aggregate treating problems.

WEMCO®

a division of
Western Machinery Company
650 Fifth Street, San Francisco 7, California
Distributors throughout the world

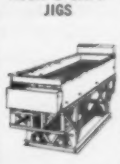
THE WEMCO LINE OF QUALITY MACHINES FOR PROFITABLE AGGREGATE PROCESSING

*SAND-PREP WITH EXCLUSIVE LIFTING DEVICE

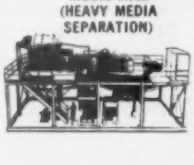
SAND-SORT

SAND-CLONE

ROCK & SAND JIGS

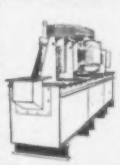


MOBIL-MILL (HEAVY MEDIA SEPARATION)

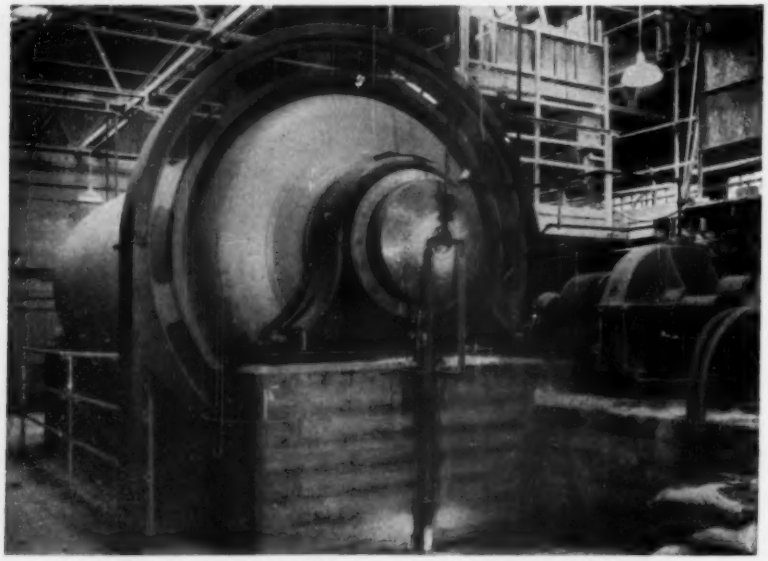


SAND-SIZER

SAND-SCRUBBER



PUMPS



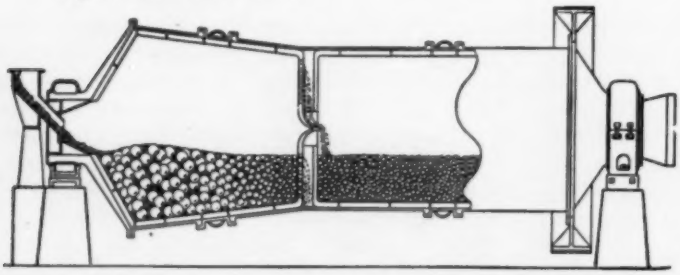
Hardinge 9' x 22' Pebble Tube Mill Wet Grinding Zircon in Open Circuit.

Hardinge TUBE MILLS...

... for wet grinding
(in water or acid pulps)
Titanium Pigments
Manganese Dioxide
Diatomaceous Earth
Limestone

... for dry grinding
Fillers
Silica Flour
Gypsum
Carbon Black
Pigments
Cement materials

Regardless of the requirements, Hardinge Tube Mills are designed to meet specific needs. Available from 2 to 10 feet in diameter; 6 to 35 feet in length; single or multiple compartments; with acid proof lining of rubber, silica and porcelain. Complete specifications on request. Bulletin 18-B-7



Tricone compartment Tube Mill with grate and lifters.

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COMPANY, INCORPORATED
YORK, PENNSYLVANIA • 240 ARCH ST. • Main Office and Works
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco • Birmingham • Jacksonville Beach

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PEOPLE IN THE NEWS

(Continued from page 40)

Burton elected at Marble Cliff

VICTOR C. BURTON has been elected vice president in charge of operations at Marble Cliff Quarries, Columbus, Ohio, and appointed to the firm's executive committee. Mr. Burton, who has been with the firm four years, was assistant superintendent. He is a Lehigh University graduate.

Great Lakes Carbon appointments

HENRY R. RICHMOND, formerly assistant to vice president and division general manager D. L. Marlett, has been named general sales manager for Great Lakes Carbon Corp.'s Mining and Minerals Products Division, Los Angeles. He takes over the post from the division's assistant general manager, Joseph E. Moran, who was acting general sales manager.

Appointment of two managers of marketing, Gordon G. Halvorsen and William R. Howell, were announced at the same time.

Barnes appointed technical director

RICHARD E. BARNES has been named technical director of the Perlite Institute, New York City. Mr. Barnes was formerly an engineer with the plant design and construction division of Western Electric Co. He received his BS degree in civil engineering from the University of Pittsburgh.

Kaiser Gypsum names key personnel

THREE KEY SALES appointments in the Oakland, Calif., home office of Kaiser Gypsum Co. are these:

J. J. Hague, formerly Southern Div. sales manager, is now manager of sales, with the responsibility of supervising all of the sales divisions.

Colin C. Campbell is appointed manager of the newly formed merchandising department. Mr. Campbell had served as general sales manager.

Joseph M. Angelo, formerly Central Div. sales manager, has been named assistant manager of sales.

END

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SPECIAL REPORT TO CATERPILLAR OWNERS:

CAT CATERPILLAR

Parts you can trust
...cost less per hour

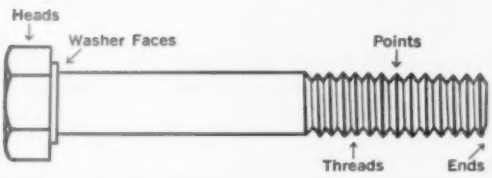
CAT ALL-PURPOSE BOLTS AND NUTS ARE STRONGER... HOLD LONGER...GRIP BETTER

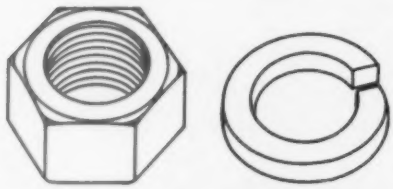
Ever twist a head off a bolt because it wasn't *strong* enough . . . or scrape your knuckle when your wrench "rounded off" the head because it wasn't *hard* enough? It's not likely to happen if you use Cat all-purpose bolts and nuts. They're highest quality in every way. For example, Cat bolts exceed Grade 6 in all requirements as rated by the Society of Automotive Engineers. Grade 5 is the average rating of bolts used in other earthmoving equipment.

WHAT GRADE OF BOLTS DO YOU USE?

Here's what's normally stocked at...	Hardware Stores, Automotive Outlets	Industrial Supply Houses, Other Mfr. Outlets	Special Order Only	Caterpillar Dealers
SAE	Grade 0-3	Grade 5	Grade 6	Exceeds Grade 6
Minimum Tensile Strength (Breaking point)	55,000-110,000 PSI	105,000-120,000 PSI	133,000-140,000 PSI	142,000 PSI
Hardness Rockwell Rating	RC 0-28	RC 19-32	RC 28-36	RC 30-38

If you need tougher, stronger hardware—get Cat all-purpose bolts and nuts. You can count on them to do a better job longer because they're stronger and harder than others.





HERE ARE OTHER CAT BOLT BONUSES YOU GET. *Heads* are higher and full size—easy to get wrenches on. *Flats* are hard and parallel—corners don't round off, are easy to grip. *Threads* are rounded at the roots and free from laps and burrs. *Points* are smooth and uniform. *Ends* are precisely rounded or chamfered—cross-threading doesn't occur. *Washer faces* are flat and have uniform thicknesses. *Heads and threads* are concentric to shaft—heads and nuts fit flush.

NUTS AND LOCK WASHERS are matched to every size bolt to give complete top-quality fasteners, too. Nut threads resist stripping. Corners do not round. Clean, smooth-fitting threads make installation fast and easy. Lock washers have smooth surfaces for maximum wear and strength.

When you need the best bolts and nuts to keep your machinery and other equipment together, see your Caterpillar Dealer. He has a large selection.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

SERVICE TIP: Get your free copy of Caterpillar's bolts and nuts reference booklet at your Caterpillar Dealer today. It has the sizes, threads and part numbers listed for quick, easy ordering. Before buying any hardware, check Cat prices first.

CATERPILLAR

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FACES & PLACES

CANDID SHOTS OF PEOPLE IN THE ROCK PRODUCTS INDUSTRY

2 MILLION TONS OF TOGETHERNESS —A dynamic duo out in Greenfield, Iowa, are Mr. and Mrs. E. F. Schildberg. Ever since 1937, when E. F. set up his Schildberg Construction Co., the two have worked together, with Mrs. Schildberg as office manager. In recent years two important additions have been made to the management picture—son John, who is sales vice president, and son Dennis, production vice president. Last year was a record breaker for the firm. More than 2 million tons of aggregate were produced.

NO SHAGGY DOG STORY—Superintendent Ken Mercer, shown with dog Chris, has a couple of good ideas represented here. At a yard beside Lee Crawford Quarry, Cedar Rapids, Iowa, Mr. Mercer sets all spare structural and maintenance materials neatly in one place. Then everyone knows where a needed part is likely to be. Second, Ken's pretty proud of his firm's steakfests, held three times a year. The charcoal grill he's leaning against is used when nearly 40 guests—customers and competition alike—get together for an afternoon of fun. And as for the public relations angle—very well done.

MR. MEIN, MERGERS AND MARKETS—William Wallace Mein, Jr., (right), president of the Calaveras Cement Co., division of Flintkote Co., discusses his marketing plans with George J. Pecaro, president of Flintkote. The two companies were merged late last year, and announced plans for construction of a new $14 million cement plant at Redding, Calif.

Flintkote common stock was recently admitted to fully listed trading on the Pacific Coast Stock Exchange.

ABOVE: DID IT HIMSELF—Superintendent Ray Carter of Naco Gravel Co., Marysville, Ohio, is leaning against a homemade portable stockpiling conveyor. Two hydraulic cylinders adjust height and form the upper leg of the conveyor supports.

INDUSTRY NEWS

Azbe award will encourage technical papers on lime

AN ANNUAL AWARD OF $1,000 for the best technical paper on lime has been announced by National Lime Association, administrator of the Victor J. Azbe Lime Award contest. Mr. Azbe has set up a trust fund to provide the awards. He hopes to trigger greater interest in lime among the world's scientists and engineers and to stimulate original thinking and research.

The awards will have a further effect—they will perpetuate the contribution to the lime industry of a man who already has given 40 years to a specialization in lime manufacturing problems and plant design. He is president of Azbe Engineering Corp., Clayton, Mo., and is on the ROCK PRODUCTS staff as contributing editor.

Anyone may enter, regardless of nationality, except the judges, Mr. Azbe, and members of his staff. Papers may treat all aspects of lime manufacturing, including calcination, hydration and limestone beneficiation and processing; research on lime physical and chemical properties and methods of tests for evaluation of lime properties and quality.

The first award will be made next fall. The winner will be chosen from entries received by March 1960. Papers should be submitted to National Lime Association, 925 15th Street, N.W., Washington 5, D.C. Lime authorities who will serve as judges are: Nathan C. Rockwood, editor emeritus, ROCK PRODUCTS, chairman; C. C. Loomis, president of New England Lime Co.; and W. E. Wing, chairman of the board, Marblehead Lime Co.

Ideal Cement establishes Marine Operations Dept.

EXPANSION OF ITS SHIPPING FACILITIES required Ideal Cement Co., Denver, Colo., to establish a Marine Operations department, announced Cris Dobbins, president. The company has recently purchased the ship S. S. Keva Ideal for transportation of cement and other materials.

Appointed as manager of Marine Operations is N. A. Nicolson. His office will be in the Merchants National Bank Building, Mobile, Ala. Mr. Nicolson will be in charge of the new ship and will supervise operation of Ideal's tugs and barges on the Gulf and Pacific Coast.

ESCSI officers to stay at helm for a second year

EXPANDED SHALE CLAY AND SLATE INSTITUTE remains under the leadership of officers who served during 1959. All were reelected at the annual meeting in Toronto. From left above, where they view a winning design in a civic square competition are: convention hosts H. I. King and J. Coffey, Cooksville-Laprairie Brick Ltd., Toronto; Lester Kennedy, Light Aggregates, Inc., Rapid City, S.D., secretary; R. J. Rogers, Cooksville-Laprairie, Montreal; Ben F. Park, Buildex, Inc., Ottawa, Kan., treasurer; Allan P. Taylor, Kenlite, Louisville, Ky., president; Cedric Willson, Texas Industries, Inc., Dallas, Texas, first vice president; L. A. Thorssen, Consolidated Concrete Industries, Calgary, Alberta, second vice president, and Frank Erskine, Washington, D.C., managing director.

Convention business concerned the shrinkage and creep program under way at the National Bureau of Standards, using concrete made of aggregates supplied by ESCSI members; additional research programs in the fields of structural concrete and concrete masonry; and approval of information bulletins to be added to its series. A panel discussion on structural concrete and concrete masonry was attended by more than 110 architects, engineers, block makers and others from Toronto and the area.

(Continued on page 50)

EAGLE Washing Equipment AGAIN chosen by Michigan producer

Back in 1952 Cheney Gravel Co., Holt, Mich., near Lansing, installed Eagle Sand Washing, Classifying and Dehydrating Equipment and an Eagle "Swintek" Dredging Ladder, all of which has given highly satisfactory performance.

F. G. Cheney recently opened up an additional operation nearby, known as Sky-Way Sand & Gravel Co. Eagle Equipment was *first choice* for this plant, based on past experience. The modern Eagle plant section pictured above has been installed and is likewise giving splendid service. A 36" x 24' Eagle Log Washer is processing coarse material, eliminating clay and soft stone sufficiently for the material in this deposit to meet specifications. Sky-Way also installed a 10" - 60' light duty "Swintek" unit on their dredge so as to operate at highest efficiency.

Again and again purchasers of Eagle Equipment come back for more . . . proving that Eagle Equipment makes money for them, gives them service and satisfaction. Send for Catalog 58 on Eagle Washing Equipment . . . . Catalog 83 on Eagle "Swintek" Dredging Ladders.

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ENGINEERS • MANUFACTURERS
137 Holcomb Ave., Des Moines, Iowa

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THERE'S A FACTORY-TRAINED EAGLE LINE DISTRIBUTOR NEAR YOU TO SERVE YOU.

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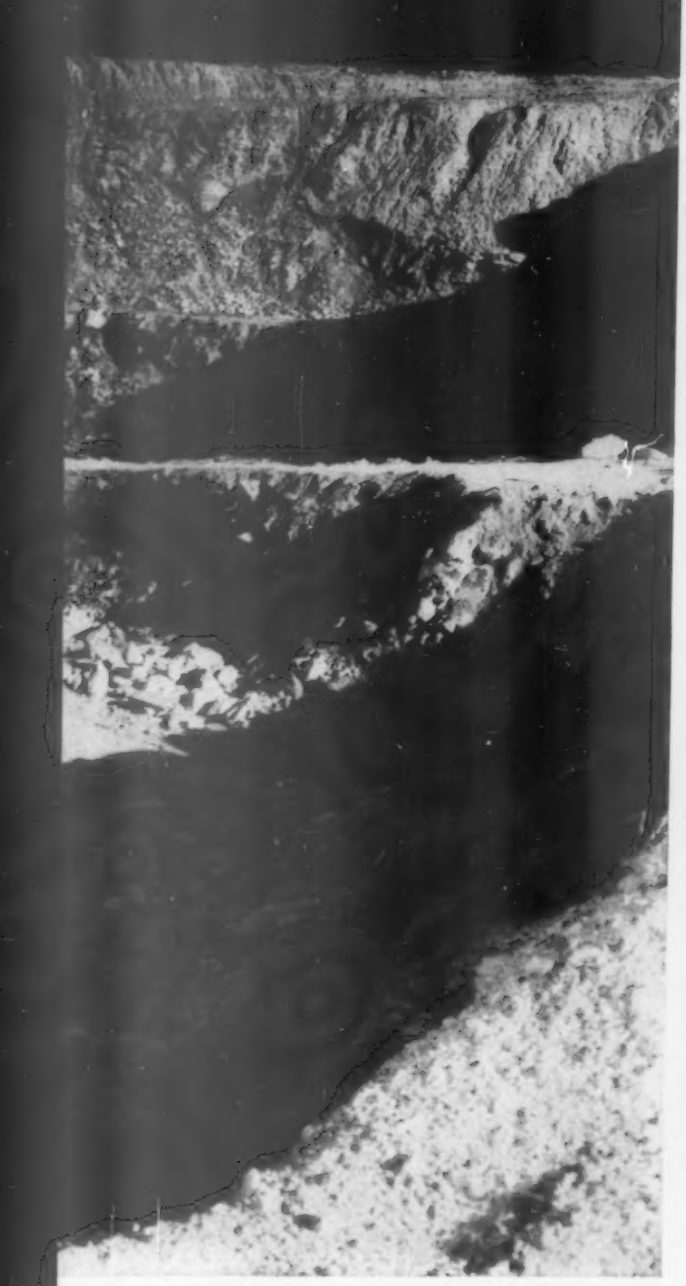
At Nello L. Teer Company's Princeton Quarry

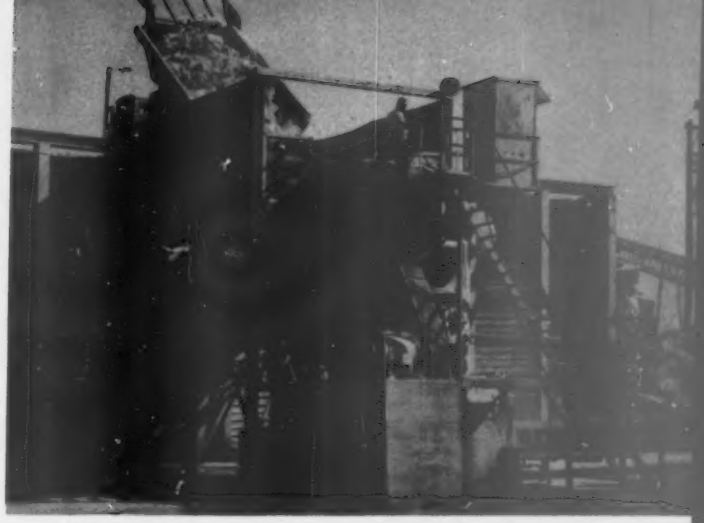
GULF MAKES THINGS

"More than 2,000,000 tons of material have been produced by this quarry since we started operations in August, 1957," reports Walter Dean, Superintendent of Nello L. Teer Company's quarry at Princeton, N.C.

"To protect our equipment investment, we rely on Gulf lubricants and they are doing an excellent job for us. In spite of unusually tough operating conditions we haven't had to replace any lubricated parts, and we have had no downtime traceable to lubrication."

The Princeton Quarry operates Simons and Telsmith crushers which are lubricated with Gulfcrown Grease and Gulf Harmony oil. Gulfcrown, a lithium-base multipurpose grease, is also applied to their conveyors, shovels, trucks, tractors, front end loaders, pumps and all other grease-lubricated equipment. Gulflube Motor Oil X.H.D., the clean-working oil, protects Princeton





This primary crusher reduces stones from 48" x 42" to not larger than 10". Capacity, 550 tons per hour. Lubricant, Gulfcrown Grease.

Princeton Quarry Superintendent Walter Dean, right, with Gulf Sales Engineer S. W. Dance. On-the-job service is one of the plus values you get from Gulf.

RUN BETTER!

Quarry's truck engines.

Says Mr. Dean: "I'm not trying to paint a pretty picture—I'm simply stating facts. We're completely satisfied with Gulf products and service."

How's your equipment doing—on maintenance and performance? See for yourself how Gulf makes things run better! Call your Gulf office, or use coupon for 88-page maintenance manual, "Gulf Contractors' Guide."

GULF

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Send copy of "Gulf Contractors' Guide."

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Galigher
PUMPS for SAND SERVICE

to handle
DRAINAGE, TRANSFER
and CYCLONE jobs
in the plant

These are the basic pumps in the rugged Galigher line . . . designed to handle the variety of tough jobs found at sand and gravel plants. They have proven through years of service at mines, mills and aggregate operations that they adapt ideally . . . and with minimum upkeep cost . . . to drainage, clean-up and material handling jobs in these industries. VACSEAL PUMPS and Galigher SUMP PUMPS are available in a wide range of sizes, materials and special linings including acid-proof. There is a model to fit your specific application.

Our sales engineering staff and our experienced distributors throughout the country are available to assist you in selecting the right pumping equipment. Ask for all the details.

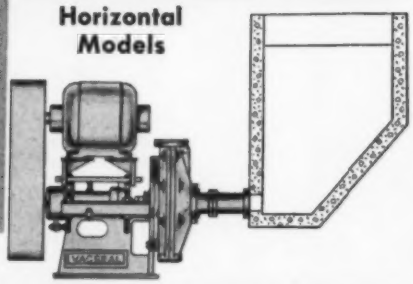
Vertical VACSEAL
Sizes — 2" x 2½" through 6" x 8"
Capacities — 50-1600 GPM
Heads — up to 100 feet

Horizontal VACSEAL
Sizes — 1½" x 2" through 8" x 10"
Capacities — 20-3600 GPM
Heads — up to 120 feet

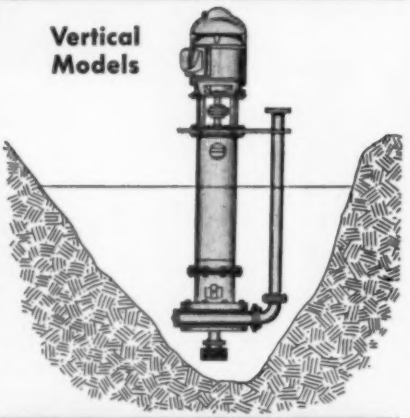
GALIGHER SUMP PUMP
Sizes — 1¼" through 6"
Capacities — 10-1500 GPM
Heads — up to 100 feet

VACSEAL PUMP

Horizontal Models

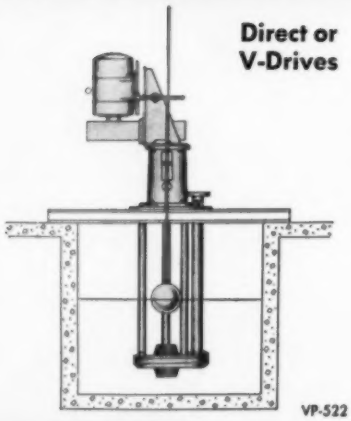


Vertical Models



Galigher SUMP PUMP

Direct or V-Drives



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(Continued from page 46)

Minerals in '59 valued at $17.1 billion, says Bureau

IN A PRELIMINARY REPORT on minerals produced in the United States in 1959, the Bureau of Mines estimated their value at $17.1 billion. This compares with $16.5 billion in 1958 and the record of $18.1 billion, set in 1957. Value of nonmetallics was $3.69 billion, up from $3.34 billion the year before.

In a breakdown of the nonmetallic mineral figures, the Bureau reported cement production was nine percent higher than in 1958, and four percent higher than its 1956 peak. Annual capacity reached 410 million bbl. Scrap mica was up about six percent, but feldspar output was about the same. Fluorspar production was 180,000 short tons, the lowest in more than 20 years.

Production of phosphate rock and potash increased three and ten percent, respectively, over 1958. Lime, reaching a new high, was 17 percent above the year-earlier figure. The quantity of primary barite sold or used increased about 40 percent. Gypsum and gypsum products neared new highs because of residential construction, but the Bureau gave no figures for this segment of the rock products industry. Domestic production of bauxite, at approximately 1.5 million long dry tons, represented a 14-percent increase over 1958.

Construction established a new record in 1959, said the Bureau. It rose about 15 percent over 1958 despite the steel strike, shortages in highway building funds and difficulties in home financing. Output of stone, sand and gravel paralleled the upward construction trend, gaining 10 to 15 percent.

Bureau of Mines compiles 1958 production statistics

EIGHT NONMETALLIC MINERALS reached new production levels in 1958, says the Bureau of Mines in Report MMS 2979—"World Mineral Production in 1958." This group included cement (263,001,000 metric tons—1 =2,240.62 lb.); diatomite (760,000 mt.); gypsum (33,435,000 mt.); magnesite (5,400,000 mt.); phosphate rock (35,400,000 mt.); and potash (8,000,000 mt.).

The report also shows that the United States leads the world in min-

(Continued on page 54)

MORE MUSCLE--MORE OUTPUT!

25-TON PR619 REAR DUMP...FROM ATHEY'S T-LINE!

The new Athey PR619 has built-in "muscle" of tough T-1* steel; the sinew to carry extra tons of payload for its weight, and the strength to take your biggest loads with ease. PR619 puts a wide stable target under your shovel for fast loading. It can maneuver in the tightest spots, hit speeds over 30 mph behind the rugged Caterpillar No. 619 Tractor.

PR619 plus features include fast, 12 second dumping, a low center of gravity for easy handling and safe operation, self-aligning two-stage hydraulic hoists and a payload capacity 2½ times empty vehicle weight!

Find out how this new team can cut your cost, speed your cycles and get greater production under your present loading equipment. Your Athey-Caterpillar dealer is the man to see.

*Registered trademark, United States Steel Corporation

Write for fact-filled brochure on the Athey PR619 Rear Dump Trailer to get the data on this new unit.

BONUS PAYLOAD—You haul more payload, less dead weight with the PR619. Low slung design permits fast hauling, tight turns with complete safety.

12 SECOND DUMP—With positive hydraulic control lets your operator spot the load with ease, dump quick and clean. No hang up, no waste motion.

Athey

PR619

REAR DUMP TRAILER

Athey PRODUCTS CORPORATION, 5631 WEST 65TH STREET, CHICAGO 38, ILLINOIS

Enter 1099 on Reader Card

Standard conveyor system shown handles aggregates used in new concrete block plant producing 35,000 blocks daily. Owner appraisal: "We thought the new conveyor would require a week to get the bugs out . . . but it operated trouble-free right from the start."

WHY MATERIALS ON BARBER-GREENE

You get most efficient design, lower cost components and fastest delivery on Barber-Greene standard or specially engineered systems

Here are reasons your materials ride for less when Barber-Greene solves any bulk material handling problem:

MOST EFFICIENT DESIGN—Barber-Greene design engineers, backed by more than 40 years of conveying experience, design for you the most efficient, most economical conveyor system available.

LOWER COST COMPONENTS—Your design savings are compounded by your savings on standardized conveyor components. Barber-Greene, pioneer and largest producer of these higher quality components, passes on to you, volume-production savings no other manufacturer can equal. That means that when your conveyor can be entirely built from standardized components, and most can, your savings are king-sized. Even if yours is a very special type of application, you still save because of Barber-Greene's vast experience in designing and building specially engineered conveyor systems.

NO TIME LAG—Barber-Greene standardized components take the urgency out of your conveyor emergency three ways: 1) faster quotation; 2) faster delivery; and 3) faster erection.

You can find out how much you'll save merely by calling your nearby Barber-Greene Conveyor Representative. He will quickly quote you money-saving prices on either your entire system or on whatever conveyor equipment you need. Call today.

Redi-Fab conveyor shuttles aggregates from crushers to screens to stockpiles in this modern plant. Low maintenance torque arm drives are used. Redi-Fab units offer immediate selection, fastest delivery and erection, easiest alteration, and heavy duty construction.

RIDE FOR LESS
BELT CONVEYORS

YOU SAVE ON ANY SIZE JOB

You can benefit from these savings whether your conveyor is fabricated from channel frame or giant gallery truss, whether capacities handled are a few hundred or thousands of tons hourly, or whether belt widths are 18 or 60 inches.

New PA-70 portable conveyor heads 7-model line available in lengths from 20 to over 100 feet.

Your belt conveyor equipment headquarters

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Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

Why gamble when you buy used equipment?

When you buy a used machine you expect it to make money for you. And if you don't make money because it "wasn't what the man claimed it to be," you've made a bad deal . . . lost money. But there's no such risk when you buy from a Caterpillar Dealer. Here's why: He reconditions, classifies and guarantees his trade-ins to take the guess and gamble out of your buying. Because he does a lot of trading, he offers a wide selection of rigs—machines you can buy at realistic prices. For example:

1 **A "BONDED BUY"** in used Cat-built equipment is your best buy *anywhere*. This is an exclusive written guarantee bond, up to $10,000, assuring you parts and labor repair protection during the warranty period . . . similar to a new machine guarantee.

2 **A "CERTIFIED BUY"** covers units of any make in good condition. Machines with lots of life and profit left in them. This type of protection carries the dealer's written guarantee of satisfactory performance.

3 **A "BUY AND TRY"** deal is more than its name implies. It means a fair buy for the price asked. You are protected with the dealer's written money-back agreement. Something you won't get at most used equipment lots.

Only a Caterpillar Dealer will provide you with bonded protection, or written protection of any kind. He will also back you with prompt service and parts you can trust. You'll find a Cat Dealer listed in the Yellow Pages. Visit his used equipment lot for the best buys on the market. Compare his values with anyone else's . . . you'll soon join the family of satisfied Caterpillar customers.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

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BEST BUYS IN NEW AND USED EQUIPMENT

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(Continued from page 50)

eral output. It ranked first in production of 29 of the 63 commodities included in the survey. The U.S.S.R. led in eight, while Canada led in three.

These are the production percentages of nonmetallic minerals attained by the U. S. in 1958: Asbestos, 2.2; barite, 19.2; bauxite, 6.3; cement, hydraulic, 21.1; diatomite, 44; feldspar, 46; fluorspar, 18.1; gypsum, 26.1; mica, 59; phosphate rock, 42.7; potash, K_2O equiv., 24.5; pumice, 21.8; sulfur, native, 71.5; talc & soapstone, 37, and vermiculite (estimate) 76.4.

Insufficient information was available to include some important construction materials, such as sand, gravel and crushed stone.

Phosphate industry spokesmen tell Florida of its benefits

POINTING UP AN EFFECTIVE public relations program for the phosphate industry in Florida are reports of speeches made by industry leaders. Example 1: H. S. TenEyck, vice president of International Ore and Fertilizer Co., told Propeller Club members in Tampa that phosphate contributes a tidy sum to the port.

This is part of his figuring: the 500 ships that pick up the rock pay about $300,000 a year in port dues; pilot fees bring in another $144,000 and wharfage charges amount to $100,000. Stevedores receive wages of $200,000; Tampa merchants sell about $300,000 worth of supplies to the ships per year; and repairs in the shipyards run into a considerable figure. Even medical expenses paid by visiting seamen amount to about $30,000 per year, he added. According to Mr. TenEyck, the phosphate rock shipped from Tampa amounts to 20 percent of production.

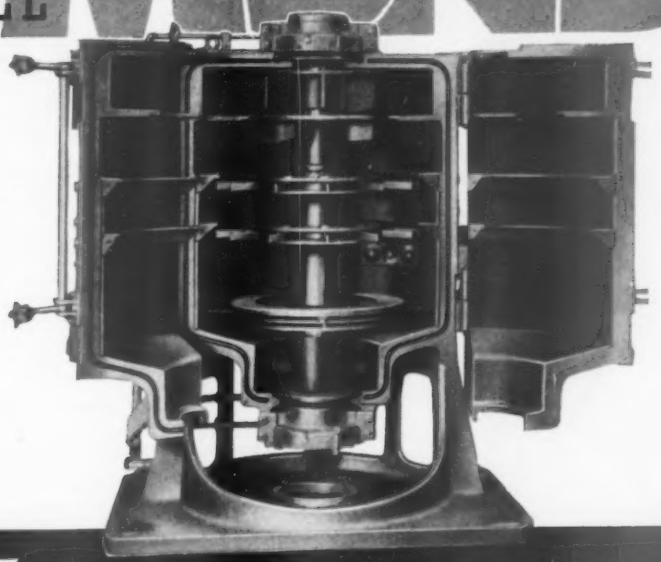
Example 2: Dr. Joseph D. Clary, assistant general manager of Davison Chemical Co., gave an idea of the importance of phosphate mining in the Polk-East Hillsborough County area to teachers attending a physical science conference at Florida Southern College. First, he said that the more than 5,000 persons employed by the industry draw more than $25 million a year in salaries.

Taxes paid by phosphate firms in the counties are about $2¼ million per year. Seven of the 10 largest Polk County taxpayers are phosphate companies. The other three include two

(Continued on page 60)

RAYMOND VERTICAL MILL

ACCESSIBLE
AUTOMATIC
DUST-FREE
EASY CONTROL
SIMPLE DESIGN



. . . FIRST in Hi-Fineness

FOR producers making extremely fine materials in the sub-sieve particle sizes, the Raymond Vertical Mill offers special advantages in operating economy and product quality.

This modern design emphasizes such features as:

1. **Wide application to non-metallic minerals, chemicals, pigments, synthetic resins, phosphates and many special materials.**
2. **Quick and complete accessibility for adjustments, and clean-outs for product changes.**
3. **Easy control of classification, and ability to meet exacting particle size distribution.**
4. **Automatic, dust-free operation with no overheating of product.**
5. **Compact layout and flexible installation.**

The Raymond Vertical Mill is serving industry in the production of solid rocket propellants, and it does an excellent job in pulverizing ammonium nitrate and ammonium perchlorate oxidizers.

If you have a special high-fineness grinding problem, write for information.

This Raymond Bulletin #78 gives detailed information on superfine pulverizing operations. Write for your copy.

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Raymond Division

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If your rock is right for drag here's a rig that offers you

New Gardner-Denver Zephyr—available on wheel or crawler mounting to meet drilling requirements.

bit operations
new drilling economy

NEW GARDNER-DENVER ZEPHYR ROTARY BLAST-HOLE DRILL

Self-Propelled . . . Completely Self-Contained . . . Designed for Fast, Efficient, One-Man Operation

10,000-lb. pulldown—hydraulic pulldown conservatively rated at 10,000-lb. bit pressure. For drilling fast, straight hole in tricky formations, pulldown is regulated by dual hydraulic controls that vary either volume or pressure. Pulldown circuit can be operated continuously at peak loads.

Instantaneous travel control—no lost time in coming out of the hole. While on pulldown or while hoisting, feed rates are changed instantly by use of hydraulic controls. Bit up-travel speeds of 100′ per minute.

Centralized controls—all controls for drilling and drive grouped at rear of drill for ease of operation.

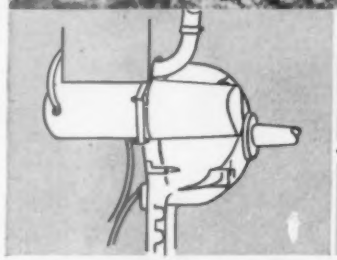
Heavy-duty rotary table—four speed options varying from 20 to 450 rpm. Rotary sleeve supported by heavy-duty, tapered bearings rated at 25,000-lb. thrust load. Heat-treated spiral bevel gear and pinion run in oil.

Hole sizes—from 1¾″ to 4¼″ diameters. Kellys available from 1¼″ hexagon to 3″ round.

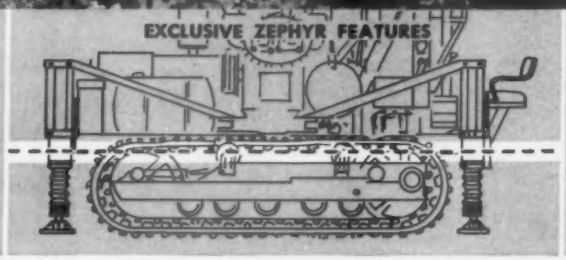
Air package—Gardner-Denver ACL air-cooled, single-stage compressor rated at 200 cfm displacement. Clutch provided so other components may be operated independently of compressor.

Contact your Gardner-Denver representative for full details.

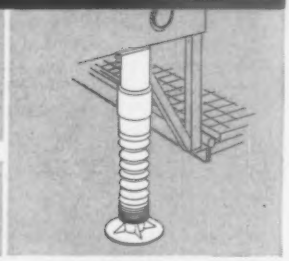
EXCLUSIVE ZEPHYR FEATURES



Torque converter for smoother operation on the road and while drilling.



Track stability—low center of gravity on either model assures maximum safety and stability.



Four hydraulic leveling jacks for faster setups and greater stability.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

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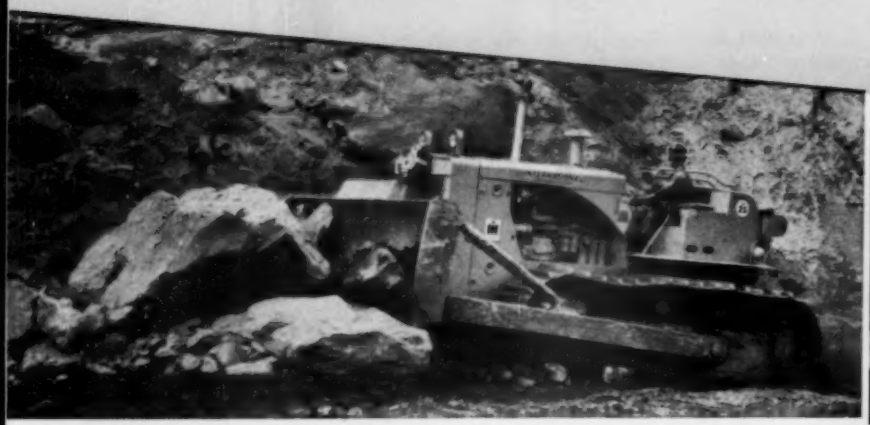
Power-steer and power-shift

with TD-25 standard equipment ...for full-load turns ...full-speed cycles!

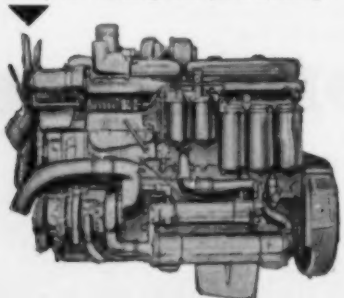


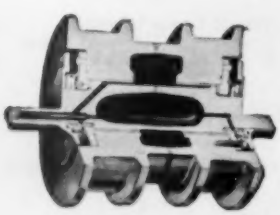
Keep big rock loads on the move *full time*, with exclusive Planet Power-steering. Full power on both tracks, full time is the answer! And Hi-Lo, on-the-go power-shifting lets you match power to condition, instantly, and keep the yard-boosting advantage of uninterrupted momentum!

Cleaning the face of a Missouri strip mine behind a big dragline, this TD-25 shoves "tractor-sized" boulders aside with the greatest of ease. The "25" also builds dragline walkways and haul roads; pushes loaded trucks; and drastically cuts the cost of clearing new stripping areas.

Big power "plus" of the new TD-25 is the new direct-start, turbocharged 6-cylinder International DT-817 diesel engine. This versatile engine also powers International Payscraper®, Paywagon®, and rear-dump Payhauler® models — plus the TD-25. Equipment-spread power standardization simplifies your servicing and parts-stocking.

Thickest-shelled roller design in the crawler industry—with king-size lube reservoirs and seal-protecting pressure-relief passages—let you power-lubricate without affecting seal life or efficiency. These are Dura-Rollers—the track rollers that make 1,000-hr lube intervals practical!





No attachment! No after-thought! No stop-gap!

Years'-proven Planet Power-steering and Hi-Lo power-shifting are *designed-in, built-in,* basic standard equipment of the new 230-hp International TD-25.

With "live-track" Planet Power steering, you get full-load king-size crawler efficiency on turns, as well as straight-aways. And Hi-Lo power-shifting gives you on-the-go matching of power to load to give you big, cycle-speeding advantages!

International Planet Power-steering eliminates load-limiting "dead-track" drag. And Hi-Lo power-shifting does away with time-wasting "gear-shift lag." No wonder the new TD-25 can outearn king-sized clutch-steered crawlers up to 50%—on tough high-walling; overburden removal; and many other coal, mineral, or building-material mining jobs!

Big-capacity track-and-engine teamwork

New TD-25 7-roller tracks are strength-matched to team with the full effort of the New 230 hp diesel engine. The "25" is platformed on super-rugged double-box-beam frames—and carried smoothly on International's new minimum-maintenance Dura-Rollers!

Press the direct-start button, to command the "25's" free-breathing diesel horsepower. Dual valving of the "25's" high-torque DT-817 engine provides for peak turbocharging efficiency—to deliver full-rated performance from sea level to timberline!

Full TD-25 performance is at your fingertips, full time!

Power-shift and power-steer the new "25" with king-sized loads—around curves, upgrade, anywhere. Compare years-proven simplified International planetary design that's engineered and located to break the load-limiting, time-losing steering and shifting bottlenecks which plague king-sized clutch-steered crawlers. Measure all the "25's" standard equipment extra value features. Let your International Construction Equipment Distributor demonstrate!

International® *Construction Equipment*

International Harvester Co., 180 N. Michigan Ave.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

IT'S *what's behind*
THE BALL THAT COUNTS!

...and Bituminous, too!

BEHIND BITUMINOUS is unlimited supply and ever increasing technology of utilization. *No other usable power source is backed by both these important characteristics.*

You can base your constant power-fuel needs on bituminous with confidence—B&O Bituminous, of course! ***Ask our man!***

BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., PHONE: LEXINGTON 9-0400

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(Continued from page 54)

railroads and a citrus company. The phosphate firms contribute to the railroads' prosperity with $10 million per year directly. Indirectly, railroads receive twice that much more from other sources for transportation of phosphate rock, superphosphate and other products, as well as sulfur and commodities required by the industry's operations.

In addition, said Dr. Clary, these phosphate companies pay $9 million annually for electricity, $8.5 million for industrial equipment and $2¼ million for electrical equipment and supplies. All are purchased in the area, he concluded.

Canada compiles figures for lime, asbestos, cement

DOMINION BUREAU OF STATISTICS, Ottawa, has compiled in Catalogues 44-209, 26-205, and 44-204, respectively, annual production statistics for its lime, asbestos and cement industries. An increase was shown for lime and cement, a decrease for asbestos.

Specifically, Canadian producers of lime shipped or used 1,596,422 short tons of lime, valued at $19,465,823 during 1958. Comparable figures for 1957 were 1,378,617 tons valued at $16,678,614.

Shipments of crude and milled asbestos fibers dropped in 1958 to 925,123 short tons from 1,046,086 tons in 1957. Value of shipments in 1958 was $92,276,748, and in 1957, $104,489,431.

A record was established by the cement industry in Canada during 1958 when producers shipped or used 6,153,421 tons valued at $96,414,142. Shipments of 6,049,098 tons were valued at $93,167,477 in 1957. Data excludes cement made from imported clinker.

Study compares portland and blast-furnace slag cements

RESEARCH CONDUCTED in the laboratory sponsored jointly by National Sand and Gravel and National Ready Mixed Concrete Associations at the University of Maryland has resulted in publication of "Comparisons of Strength Development between Portland Cement and Portland Blast-Furnace Slag Cement." In the experiments, samples of each were taken

(Continued on page 64)

D-443

built to keep you in aggregate . . . at a profit

DIAMOND PORTABLE *Rotor-Lift* CRUSHING PLANTS

Diamond makes everything for the production of aggregate

- Portable and stationary crushing plants
- Jaw crushers
- Roll crushers
- Vibrating screens
- Scalping and scrubbing screens
- Drag washers
- Conveyors
- Plate feeders
- Apron feeders
- Grizzlies
- Bins and hoppers

Diamond has the equipment, experience, manufacturing facilities and distributor set-up to handle any size job to your satisfaction. Try them.

When you can turn out 300 to 400 tons of road gravel per hour in 25% to 35% crush, you're in a good profit position. That's what Diamond Portable Plants are doing in locations all over the country. Here's how and why—

- **line-flo system moves material through plant without delay—no extra scalpers, no by-passes, no bottlenecks.**
- **rotor-lift recirculates material fast, distributes it without batching or bunching on feed conveyor.**
- **long jaw design of jaw crusher handles the hardest of rock, gives maximum size uniformity.**
- **high speed roll crusher steps up output by eliminating reruns through jaw crusher, has high capacity for its weight, requires low h.p. per ton produced.**
- **balanced vibrating screen does thorough job of separating materials without clogging, can be depended upon for long, trouble-free service.**
- **belt conveyors run on antifriction bearings, move material quickly and smoothly.**

Add to these advantages complete portability in the pit or on the road without costly delay, and a choice of drives to best suit your conditions. It's easy then to see why companies that base their profit on aggregate production ability turn to Diamond when starting a new operation or expanding an existing one. Check with your Diamond distributor.

DIAMOND IRON WORKS

DIVISION

GOODMAN MANUFACTURING COMPANY

Halsted Street and 48th Place • Chicago 9, Illinois

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New pit...new Caterpillar machines...

Alexco Aggregates Inc. completely equipped their new Glen Lake, Minn., operation with Caterpillar machines. This includes two Cat Diesel Engines to operate crusher and shaker, two Cat Electric Sets to supply power for the conveyor system. The pit supplies road materials ranging in size from 1½" crushed rock to ¾" asphalt aggregates.

A Cat No. 977 Traxcavator with side dump bucket loads in excess of 3,000 tons per 10-hour day—stockpiles too.

"This machine is ideal for our pit," says Superintendent Bill Grimme. "It's fast, increases production, and is easy on the operator."

Look at these features that pay off in more speed and volume for bigger profits:

Reduced Cycle Time—Less Loading Area—turning to load is unnecessary with the exclusive 2¼-yd. side dump bucket. Maneuvering is confined to forward-reverse movement.

Top Efficiency—Less Load Time—operator has good visibility to cast material accurately and with little spillage. Lift, tilt and dump levers are located for one-hand control. With float and lock-out mechanism, operator can release levers while bucket is in motion. An automatic positioner returns the bucket to desired digging angle. And the bucket can be tilted backward a full 40° at ground level to pry a full load on every pass.

NOW . . . A TOUGHER NO. 977 SERIES D: new track links for greater strength and longer wear; hydraulic track adjusters, already standard on the Series E, now available for the Series D.

FOR THE SERIES E MODEL: new lifetime lubricated rollers and idlers that need no servicing until rebuilding. New triple grouser track shoes, for added traction in soft materials, have low turning resistance and longer wear. The No. 977A Bulldozer has new durability . . . offers added versatility to the No. 977 Traxcavator.

top production from the start

Two D8s with "U" blades make every pass pay off... stockpiling and 'dozing material into crusher hopper.

With the No. 8U Bulldozer you get the shearing action of an angling blade . . . plus the rolling action of a straight blade. Material is forced to the center of the blade where a capacity load is carried the full length of the pass. Spillage over the top or out the sides is reduced. Tests show that 'dozing production is *increased up to 50%* when you replace a conventional blade with a Caterpillar "U" blade.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BORN OF RESEARCH
PROVED IN THE FIELD

THERE'S A NEW D8 . . .
THE SERIES H
WITH THESE NEW FEATURES:

POWER SHIFT TRANSMISSION—with the exclusive torque divider that combines efficiency with fluid motion. Changes speed, direction instantly, under full load and with a flick of the fingers. Direct drive and torque converter drive also available.

MORE HORSEPOWER—235 HP flywheel. More power, more production.

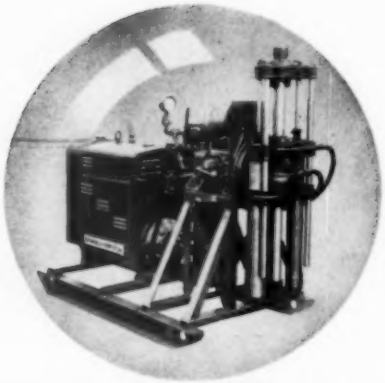
BIGGER BY 4,700 LB.—Track gauge increased to 84"; length of track on ground now 114"; square inches of contact now 5,050.

LIFETIME LUBRICATED ROLLERS AND IDLERS—and they are bigger and tougher.

DRY-TYPE AIR CLEANER—removes at least 99.8% of dirt in the intake air—service in five minutes.

S&H MODEL 30

CORE DRILL MACHINE



• LIGHT
• COMPACT
• PORTABLE
• VERSATILE

- The ideal machine for foundation investigation and shallow mineral exploration.
- Available with either screwfeed or hydraulic swivelheads with or without built-in water pump and a wide choice of power units.
- Unit can be skid, truck, or trailer mounted.
- The Model 30 is a quality machine produced by a quality manufacturer.

Look for our emblem... It's your Seal of Quality

SPRAGUE & HENWOOD, Inc. S&H
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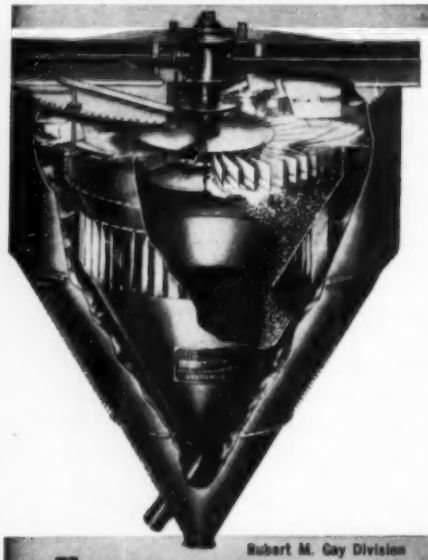
USING SCREEN SEPARATIONS? NOTHING CLASSIFIES AS PERFECTLY AS AIR

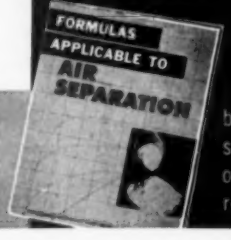


GAYCO
CENTRIFUGAL AIR SEPARATORS

Classify practically all dry fine materials

You get:
- CLOSER SEPARATIONS
- IMPROVED PRODUCTION
- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh.
Timken bearings.
Choice of Standard or Heavy-Duty Models.



this helpful booklet sent on request

Robert M. Gay Division
UNIVERSAL ROAD MACHINERY CO.
117 Liberty St., New York 6, N. Y.
Factory and Laboratory: Kingston, N. Y.
In Canada: Watson-Jack Hopkins Ltd., Montreal

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(Continued from page 60)

from three sources. In each case the regular cement and the portland cement constituent of the portland blast-furnace slag cement were ground from the same clinker.

Strength tests were made on both mortar and concrete under each of five curing conditions encompassing extremes from continuous storage in the standard moist room to highly unfavorable combinations of drying and temperature. Data indicated that PBS cements may differ in strength-producing properties from their regular cement counterparts, but the differences are probably no greater than may be encountered among different shipments of the same type cement, either from a given or a different source.

Cement plant improvements: palletizers, scales, silos

NEW PALLETIZING EQUIPMENT at Riverside's Crestmore plant, new scales at Ideal's Trident and Devil's Slide plants and silos at North American's Alsen plant are among recently reported cement plant improvements. Ideal Cement also has acquired a 25-acre site in Seattle for a storage and distribution terminal.

Riverside Cement Co., Los Angeles, is cutting loading time at its Crestmore, Calif., plant with its new palletizer and two new, four-spout bag packers. Each fills 24 sacks per minute. An extensive conveyor system supplements the sacking and palletizing equipment for direct loading onto trucks. The installation is housed in a new 60 x 190-ft. warehouse. Four trucks can be loaded in one-quarter of the time previously required to load one truck.

Ideal Cement Co., Denver, has ordered six 150-ton scales for its Devil's Slide, Utah, and Trident, Mont., plants. Installation was expected early this year. The scales, for truck and rail car weighing, are made up of seven sections. Total dimensions for each one are 10 x 170 ft. Howe Scale Co. supplied dual weight recorders, with a 150-ton recording beam for railroad cars and a 50-ton dial and printer for trucks.

North American Cement Corp., New York, N.Y., is erecting 10 silos, each with 18,000-bbl. capacity, at its Alsen, N.Y., plant. Four interstice bins are part of the setup, with 4,300-bbl. capacity each. The plant has resumed

(Continued on page 68)

last year more than 150 multiwall users reduced their packaging costs thru UNION-CAMP'S

BAG CONSTRUCTION

another FREE service of the ★5 Star Packaging Efficiency Plan!

How much could you save through UNION-CAMP'S 5-Star Packaging Efficiency Plan? Look at the record. Last year a single feature of this unusual service—bag construction—helped over 150 companies cut their multiwall costs. By tens of thousands of dollars!

Improved bag construction lowered the basis weight of a southern packer's multiwalls by 10 per cent. He netted $30,000 as a result. Another firm saved $42,000. A third, following UNION-CAMP'S recommendations for a new, stronger closure, largely eliminated breakage and netted packaging economies totaling $4.05 per M.

In addition to bag construction this comprehensive packaging program offers you four other important services. Bag design. Specifications control. Packaging machinery analysis. A survey of your plant. And it's free —regardless of the brand of multiwalls you now use.

Why not take advantage of it now by getting in touch with your local UNION-CAMP man?

UNION-CAMP®
MULTIWALL BAGS
Union Bag-Camp Paper Corporation 233 Broadway N.Y. 7, N.Y.

★ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY

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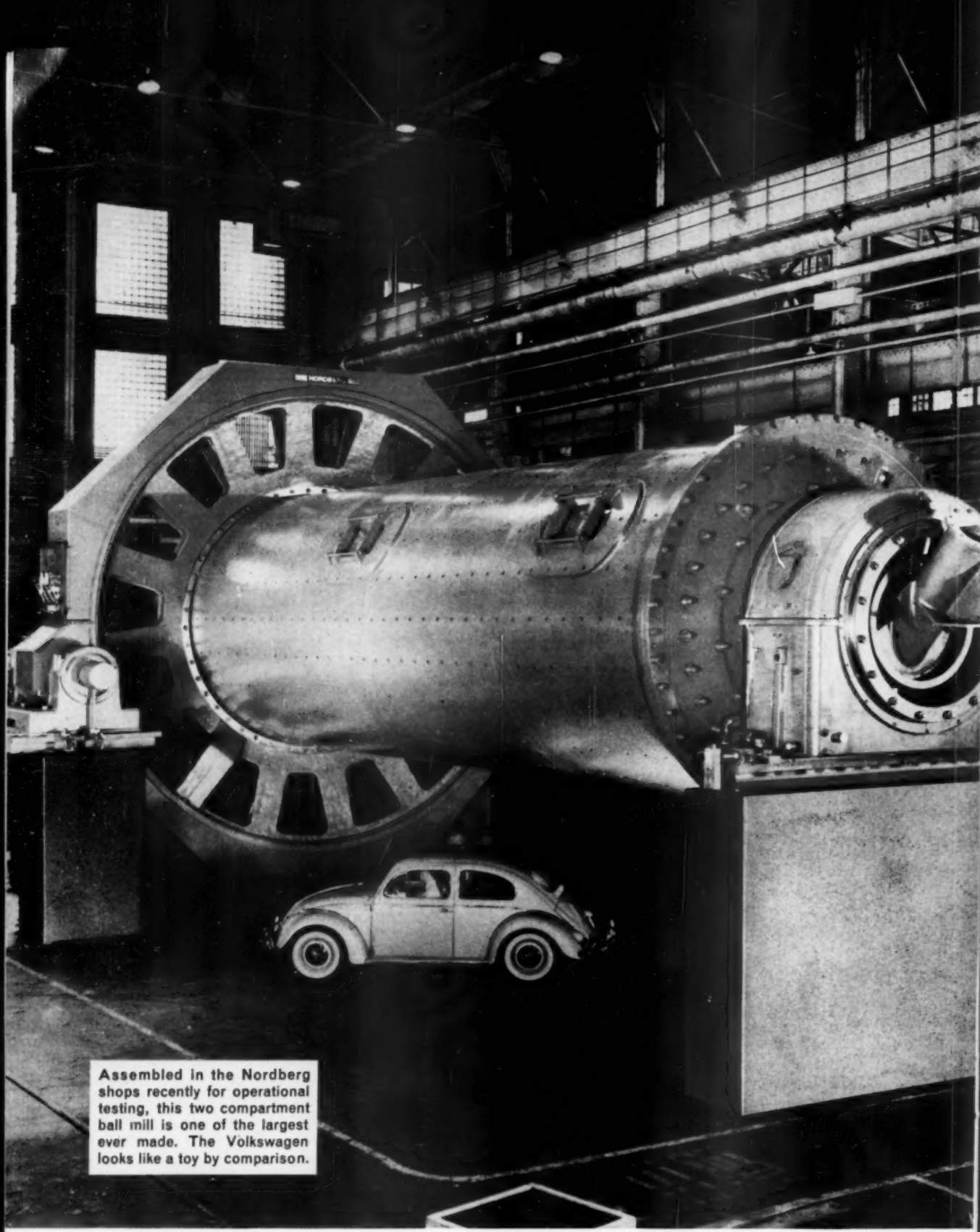


Assembled in the Nordberg shops recently for operational testing, this two compartment ball mill is one of the largest ever made. The Volkswagen looks like a toy by comparison.

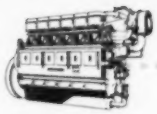
SYMONS PRIMARY GYRATORY CRUSHERS

SYMONS® CONE CRUSHERS

SYMONS VIBRATING SCREENS

SYMONS VIBRATING GRIZZLIES

ROTARY KILNS and COOLERS



NORDBERG ENGINES

NORDBERG sets the pace in LARGE GRINDING MILLS

to turn out greater tonnages at lower cost per ton

Nordberg has recently completed five of the largest grinding mills ever built for industrial service. These two compartment Nordberg ball mills (see opposite page) are 12 feet in diameter by 36 feet long, each powered by a 2500 hp synchronous motor, operating at 10% beyond rating. These mills are being installed in a new 5 million barrel per year wet process cement plant. The economies of using very large grinding mills to turn out greater tonnages at lower cost are important, however, to many other large ore and mineral reduction processes, as well.

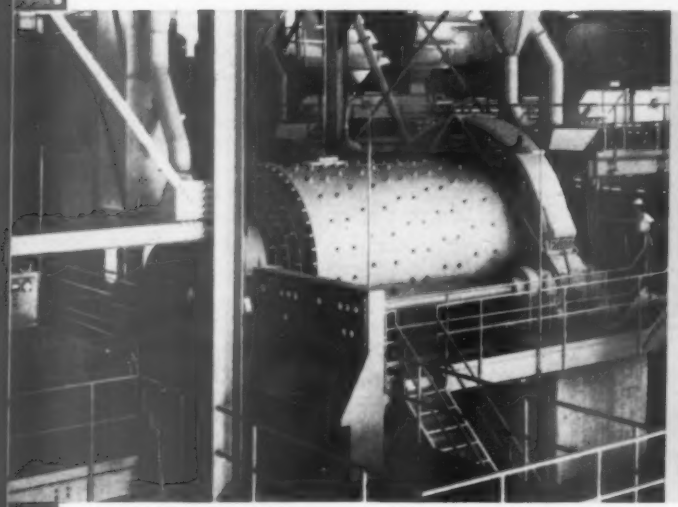
Consider some of these basic advantages:

1. *Lower construction and installation costs . . .* A single, large mill requires less floor space than several smaller ones, and only one foundation is required. Thus, construction costs are lowered and, in most cases, production is increased.

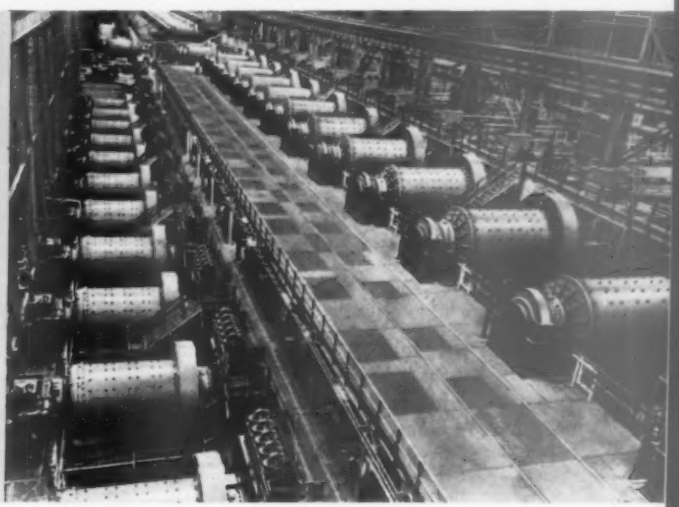
2. *Simpler automatic operation . . .* Where automatic operation is required, larger mills permit simpler handling with fewer controls. This lowers initial investment and minimizes installation and operational problems of automatic controls.

3. *Less maintenance . . .* Here, costs are again related directly to the number of mills installed. Fewer units mean less wearing parts and more dependable production. Exceptional savings may also be realized in replacement liners alone.

These are significant reasons behind the current trend toward larger grinding mills. But whether you require large or small grinding mills, you can count on the proven experience of Nordberg in furnishing the right grinding mill to meet your specific needs . . . including Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6 to 13 feet in diameter and up to 50 feet in length. *Write for further information.*



Shown here are two of five 11′ x 17′ Nordberg Ball Mills—three raw and two finish—installed in a midwest cement plant that has a capacity of 3,000,000 bbl. annually.



The largest iron ore mill installation in the world with 58 Nordberg Grinding Mills. This concentrator building houses 27, 10′ x 14′ rod mills and 27, 10′ x 14′ ball mills. Four Nordberg mills serve as standby units.

NORDBERG MANUFACTURING COMPANY, Milwaukee 1, Wis.

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NORDBERG

SYMONS . . . a registered Nordberg trademark known throughout the world.

SYMONS SCREENS NORDBERG

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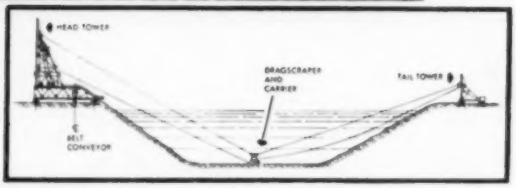
Tough Digging, Long Hauls... Routine Jobs for Sauerman DragScrapers

240-Ft. Bank... 350-Ft. Haul

This mobile Sauerman Tower Excavator digs 480 yds. per hr. on an average haul of 350 ft. from a high bank to a portable field hopper. The 12-yd. Crescent DragScraper operates between steel head and tail towers. The towers are mounted on two sets of railroad tracks and ride on four sets of trucks. DragScraper power is supplied by two hoists mounted on the head tower. One hoist operates the load and pullback cables, the other is used to tension the track cable. The hoists are controlled by one operator located in the cab on the tower. The load cable handles over 400,000 tons of material before replacement.



Drawing shows typical mobile tower excavator digging in wet pit.

75 Ft. Under Water... 800-Ft. Span

A 5-yd. rapid-shifting DragScraper supplies about 200 yds. per hr. to the plant hopper in background. Bridle tower in foreground is one of two supporting the bridle shifting cable which is controlled by the third drum of the Sauerman hoist. Lateral shifting of the DragScraper's line of operation is readily accomplished by power-shifting the trolley and tail block to a new position on the bridle cable. The DragScraper is digging 75 ft. under water and the operating span is 800 ft. from head frame to the bridle towers. Over a million tons have been excavated from this pit. The DragScraper often operates 24 hrs. a day to handle contract demands.

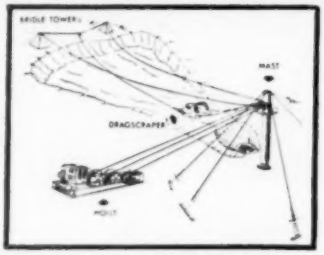


Diagram shows details of Sauerman rapid-shifting DragScraper.

Sauerman machines dig and haul in one continuous operation . . . work on high bank, dry pit or under water . . . handle most bulk materials. Consult Sauerman engineers about your job. We will promptly supply appropriate literature.

SAUERMAN BROS., INC. 630 SO. 28th AVE. BELLWOOD, ILL.

Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks

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(Continued from page 64)

barge shipment of cement to augment rail and truck shipments. The first barge shipment was made in October.

At Ideal's Seattle terminal, plans call for construction of six 30-ft. diam. x 130-ft. high silos, a packhouse, office and loading facilities. Storage capacity will be in excess of 100,000 bbl. Construction of the $2-million layout will take about a year.

Michigan Limestone ups output of fluxing fines

AN ADDITIONAL GRINDING MILL, screens, and storage and materials handling equipment have been installed at the Calcite plant of Michigan Limestone Div., U. S. Steel Corp. The new equipment increases production of fluxing fines, which partially replace large flux stone normally used when natural raw ore is used in the blast furnace. According to C. G. Hogberg, vice president of the division, growing demand for the product results from increasing use of self-fluxing sintered iron ores and concentrates.

To produce self-fluxing sinter, ore fines are mixed with carefully measured quantities of fluxing fines and fuel. The mixture is fired on moving grates to produce clinker-like chunks of self-fluxing sinter. Not only does its use result in improved operation of the furnace, but sintering increases the use of ore concentrates normally too small to be charged directly into the blast furnace.

Similar plant expansion for production of fluxing fines is under way at the division's Cedarville plant. These facilities will be ready for operation in the spring.

India, Pakistan study increase of cement capacity

THE CEMENT INDUSTRY IN INDIA and in Pakistan has been in a period of rapid development. Recent reports from those two countries indicate that supply in India has outstripped demand, while in Pakistan, further increases in capacity are necessary.

As an indication of India's industrial growth, cement plants grew in number from 18 in 1947 to 32 in March 1959. This number is expected to increase to 44 by 1961. The country's target for cement capacity by 1961

(Continued on page 71)

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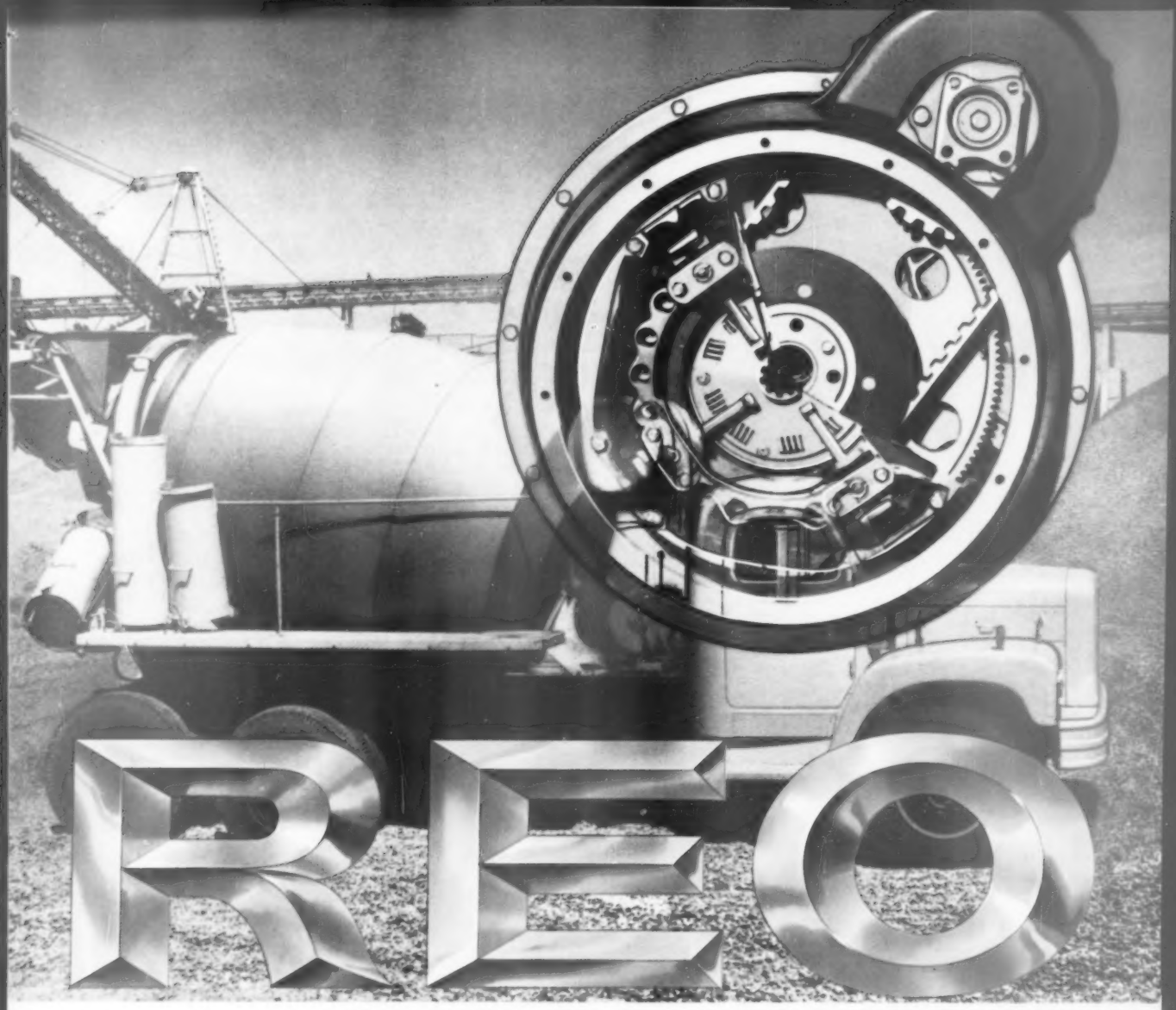

Reo's revolutionary new Flywheel P.T.O. brings to transit mix operators a "*bonus*" *payload increase from 400 to 600 lbs. per trip*—actual weight savings in a 6½ cu. yd. mixer unit resulting from the elimination of separate engine power.

Also eliminated are the headaches of separate service and maintenance requirements.

Reo engineered and installed as an integral part of the chassis engine drive, the Reo Flywheel P.T.O. supplies the mixer with a lighter and more efficient new source of power—smooth . . . even flowing . . . direct.

Most important, operators can have the "bonus" payload advantage of Reo's new P.T.O. at a low initial cost of equipment. Now available in Reo's rugged "C" Series line of transit-mix trucks. Another product of Reo's creative engineering skill has been added to the many important values found only in Reo Trucks. Reo Division, The White Motor Company, Lansing, Michigan.

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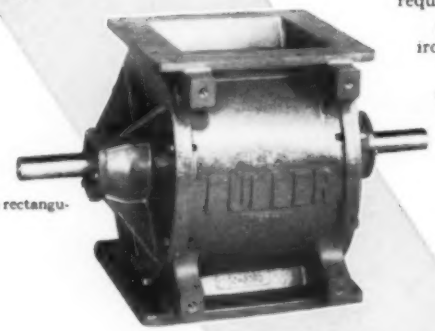
When your problem is one of feeding dry, pulverized or granular materials, why not come direct to headquarters—FULLER—designers and builders of various feeders for many uses. We have built thousands of feeders for the process industry, year in and year out, for over a quarter of a century. Many have been of special types to meet individual requirements.

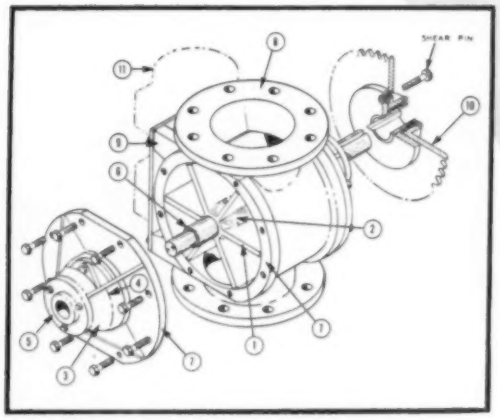
Standard feeders are built of cast iron or combinations of iron and steel. When required, they can be built of special alloys.

The Fuller Roll Feeder is especially adaptable to handling of dry, pulverized materials with volumetric accuracy, without pulsations. Vane type feeders are built for use where extreme volumetric accuracy is not particularly essential. They are built with stuffing boxes and ball bearings, for vacuum, low pressure, and general purpose uses, with circular or rectangular flanges.

For complete information write for Bulletin F-5.



Vane type feeder with rectangular flanges.



Vane type feeder with circular flanges. Rigid drive for minimum space requirements. Eliminates drive stress between feeder and related equipment.

Description of drawing above:

1. Six vanes. Two vanes seal between inlet and outlet.
2. Tapered rotor hub. Reduces friction from trapped material between rotor and headplates.
3. Integral-cast bearing brackets insure concentric bearing centers with male-female joint between headplate and feeder body.
4. Bearing brackets on sides of packing glands allow free drop of packing gland leakage; prevents material from entering bearings.
5. Integral-shielded ball bearings; Alemite fittings for ease of lubrication.
6. Shouldered shaft for externally centering and maintaining alignment of rotor, resulting in equal rotor end clearances and eliminating contact between rotor and headplates.
7. Heavy body walls and headplates. Rigid construction to permit smallest possible rotor clearances. Permits at least one possible remachining after normal wear.
8. Standard companion flange size and bolt circle permits connection to pipe size flanges.
9. Integral cast lugs for drive provides universal mounting for any type motor reducer. Rigid drive for minimum space requirements. Eliminates drive stress between feeder and related equipment.
10. Shear pin coupling with simple standard bolt shear pin.
11. Gear motor with right angle combination drive. Can be furnished with a parallel shaft drive if desired.

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(Continued from page 68)

was 16 million tons; however, the outlook now is that capacity of 9.941 million tons and a production of about 8 million tons will be possible. Present capacity, which exceeds consumption, is 7.74 million tons per year.

New trends noted in India are bulk delivery of cement and uniform pricing. The latter results in producers selling only in their own price sectors. Many of India's plants are privately owned.

Pakistan, with seven plants, has an annual capacity of 1.2 million tons of cement. Construction of four new plants is contemplated. The Industries Minister, Abul Kasem Khan, said there is a likelihood that the Zeal-Pak cement plant will add two kilns to increase production from 1,600 to 3,000 tpd. The government proposes, he said, to raise yearly output to 2.5 million tons within the next two years.

Three men from Kaiser Engineers went to Pakistan in October for a three-month survey of economic and engineering aspects affecting cement industry expansion. They were engaged by the Pakistan Industrial Credit Investigation.

Columbia-Southern opens highly automated plant

COLUMBIA-SOUTHERN CHEMICAL CORP. started producing cement in December at its new Barberton, Ohio, plant. As described by J. E. Burrell, general manager of operations, the 1.5-million-bbl. plant approaches completely autotmatic production. The key unit is the 13 x 460-ft. rotary kiln.

Dust control is fully automatic. The accompanying photo shows some of the 18 compartments in the dust collection system. There also are automatic controls to proportion feed for the ball mills and there's a push-button loading system to facilitate handling bulk shipments by rail or truck.

Limestone is supplied by the company's deep mine under the plant site. Here, there is an automatic conveyor system that feeds crushed stone directly from the mine to the plant.

Cement produced at Barberton is being marketed by Columbia-Southern Cement Corp., a newly formed subsidiary of the chemical corporation. The subsidiary owns and operates the 3.1-million-bbl. cement plant at Zanesville, Ohio.

In announcing formation of its subsidiary, C-S revealed that its board of directors includes E. T. Asplundh, chairman, David G. Hill, J. A. Neubauer, C. F. Bingham, J. E. Burrell and J. T. Owens. Mr. Neubauer is president and Mr. Owens is secretary. Other officers are W. K. Farst, vice president-operations; W. B. Sippey, vice president-sales; L. S. Williams, controller, and E. H. Eaton, treasurer.

Flintkote sizes up '60: plans further expansion

"IN THE YEAR AHEAD we expect to make periodic announcements concerning the furtherance of our expansion and diversification program," said I. J. Harvey, Jr., chairman of the board of The Flintkote Co. "We specifically are looking at new situations in the cement and gypsum fields, among others," he continued.

Flintkote started up production of portland cement at its newly completed additional plant facilities at Kosmosdale, Ky., and at Glens Falls, N.Y. A new lime plant at Salt Lake City was to come into production shortly after the first of the year. According to Mr. Harvey, the company expects 1960 sales to total $240 million, and earnings should definitely increase over 1959.

St. Lawrence Cement Co. fails in purchase offer

THE OFFER OF ST. LAWRENCE CEMENT CO., Villeneuve, Quebec, of $24 per share for 500,000 shares of Standard Paving and Materials Ltd. expired before the required number of shares became available. The cement company had hoped to gain control of the big Ontario cement user.

(Continued on page 73)

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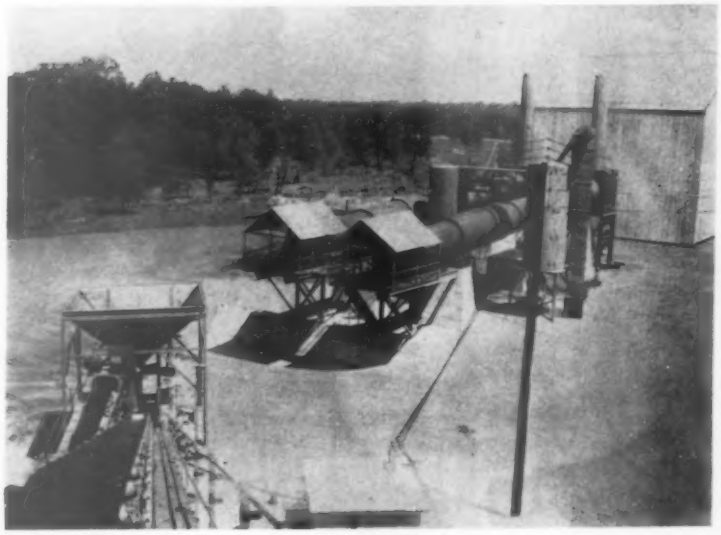
(Continued from page 71)



Solite expansions: fifth kiln, new Florida plant

SOUTHERN LIGHTWEIGHT AGGREGATE CORP., Richmond, Va., is making news on two fronts, North Carolina and Florida. In the latter state, at Green Cove Springs, a new Solite plant has been put into 24-hour, 7-day operation. It is operated by Florida Solite Corp., subsidiary of Southern Lightweight Aggregates Corp. Another subsidiary, Carolina Solite, has completed construction of a fifth kiln at its Aquadale plant.

The 2-kiln plant at Green Cove Springs is the first Solite plant to open in Florida. In the 8 x 135-ft. rotary kilns, raw material expands in temperatures up to 2,300 deg. F., forming the air cells which give Solite its qualities of lightness, natural insulation and sound absorbency.

Port of New Orleans installs new bulk unloading facility

CONSTRUCTION IS UNDER WAY on the Port of New Orleans' bulk unloading facility on the new Mississippi River-Gulf outlet, an alternate route dredged from the port to the gulf. Industrial Brownhoist Corp. has the contract for a bulk unloader with 900-tph. capacity. It is being built on the wharf site, and is slated for completion in August.

Contracts for construction of the wharf and conveyors were to be let shortly, port officials said, and they should be completed by late this year. The wharf will have water adjacent to its front and rear aprons, so that ships may be unloaded on one side and the bulk material conveyed directly into barges on the inland side, for transshipment to various other points on inland waterways.

A later phase of construction will provide equipment for transfer of bulk material from ships to railroad cars. The equipment will permit loading and unloading of sand, gravel, sulfur, bauxite, limestone, gypsum and other bulk materials. Bestwall Gypsum Co., first industry to contract for use of the unloading facility, has begun construction of a wallboard plant on an adjacent site.

Modern plant in Mexico to replace Cementos Atoyac

ALTON J. BLANK, general manager of Cementos Atoyac, S.A., Puebla, Pue., Mexico, has announced the construction of a new plant to replace the present one that is 40 years old. Daily capacity of portland, high early strength and pozzolan cements will exceed 400 metric tons (2,352 bbl.). Cost of the plant, said Mr. Blank, will be about $4.16 million. A loan of $1.6 million from the Export-Import Bank is helping to finance the project.

(Continued on page 75)

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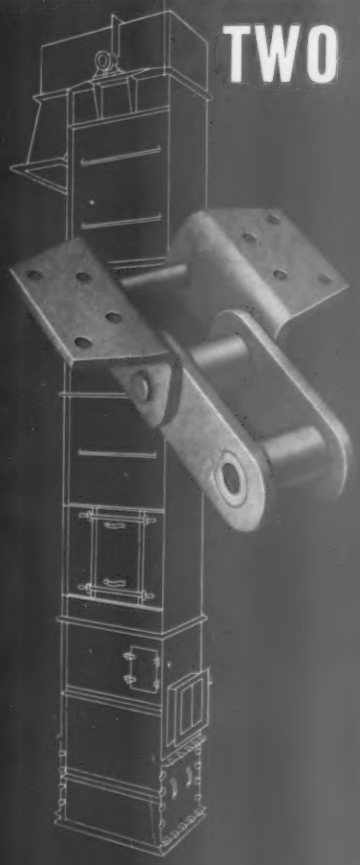

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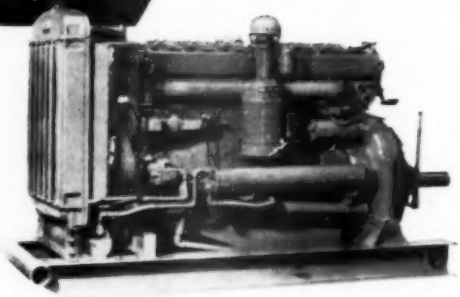

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(Continued from page 73)

NSGA foundation to support graduate engineering study

NATIONAL SAND AND GRAVEL and National Ready Mixed Concrete Associations have established a research fellowship foundation at the University of Maryland to support graduate study in civil engineering. Since 1939 the associations have supported a joint research laboratory at the university under the direction of Stanton Walker, director of research (above).

The foundation will promote basic researches into the properties of mineral aggregates and concrete and it will foster studies of problems related to the sand and gravel and ready-mixed concrete industries.

Fellowships will be awarded to civil engineering graduates who undertake graduate study and research leading to the master's and doctor's degrees. Fellows will be appointed for one year, and may be reappointed for an additional year. Fellowships carry a stipend of $2,000 plus tuition and other perquisites.

Dr. Charles T. G. Looney, head of the university's department of civil engineering, said the applications for 1960-61 fellowships should be made immediately. Forms for applications may be secured from him at the University of Maryland, College Park.

Medusa takes $9-million step in $70-million program

MEDUSA PORTLAND CEMENT CO.'S initial step in its recently announced $70-million expansion program is the addition of a new kiln at the Dixon, Ill., plant, acquisition of two limestone reserves and installation of process-improving equipment at three other locations. All this will take $9 million.

The 1-million-bbl. kiln to be installed at Dixon will be on stream in the spring of 1961. It will add about 40 percent to the plant's capacity. Important installations for improved quality and cost reduction are scheduled at the York, Pa., and Toledo, Ohio, plants. They are also planned for the company's Wisconsin subsidiary, Manitowoc Portland Cement Co. Limestone reserves acquired by Medusa are on two 1,000-acre sites, one in southern Illinois, the other in southeastern Pennsylvania. Both are considered potential cement plant sites.

"If a cement plant is closed down it is almost always due to lack of raw materials," said Ellery Sedgwick, Jr., Medusa president. "A continuing program of raw material acquisition is essential if a cement company is looking into the future."

"Natural resources" zoning plan set up in San Diego

"HARVESTING OF SAND AND GRAVEL" will be allowed in a new "natural resources" zoning classification authorized by the San Diego (Calif.) County Board of Supervisors. The action came after supervisors met with members of the County Planning Commission to discuss pressure for new sources of construction materials.

Only sand and gravel will be covered in the classification designating where borrow pits may be started. Purchasers of property in these areas will be informed of the possibility that sand and gravel firms may be their neighbors.

Allied industries, such as rock crushing, asphalt and ready-mix plants, still must have special-use permits. The supervisors agreed the board will not give "NR" zoning on its own, but only to the areas requesting it, at least in the beginning.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of November and the first 11 months of 1959 have been classified by Portland Cement Association as follows:

	Sq. yd. awarded during November	1st 11 mos.
Roads	2,901,728	47,139,665
Streets and alleys	2,022,762	31,196,879
Airports	390,136	8,698,158
Total	5,314,626	87,034,702

(Continued on page 76)

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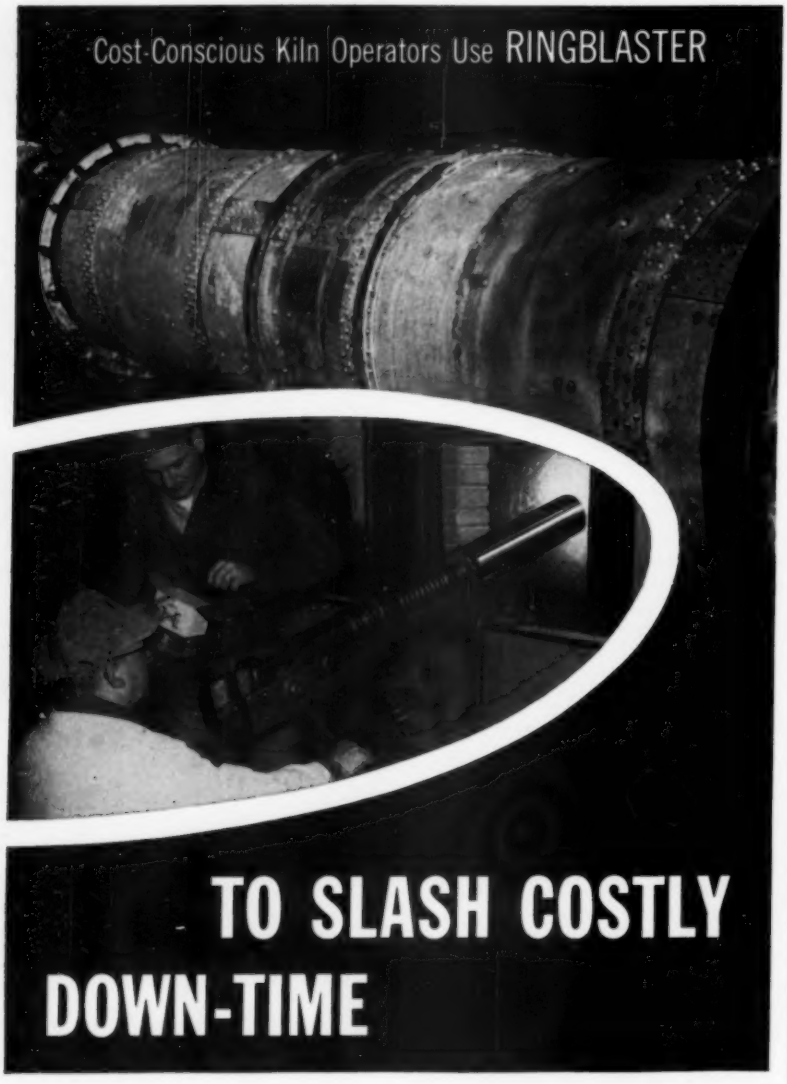

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Super-X Shell—For use in kilns over 150' long. Develops 8900 ft. lbs. of muzzle energy—breaks hard rings quickly and efficiently.

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Super-X Zinc Shell—Extra-large zinc slug penetrates toughest rings. Use them with Super-X lead slugs for maximum penetration and "knock-down" power.

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(Continued from page 75)

Safety records boasted by Alpha, Canada, Lone Star

ALPHA PORTLAND CEMENT CO., Easton, Pa., reports that three safety awards have been presented to its Jamesville, N.Y., plant. Two were presented by Portland Cement Association—the Safety Trophy award for an accident-free year (1958), and the 1,000 Day Club award for operating more than 1,000 consecutive days with no lost-time injuries. The third award was a Certificate of Commendation from National Safety Council for operating more than 400,000 man-hours without a disabling injury.

Fourteen accident-free years have been racked up by the Hull, Quebec, plant of Canada Cement Co. Company officials said the record is unequalled among members of Portland Cement Association on the North American continent.

Nine years of safe plant operations were marked by Lone Star Cement Corp.'s Bonner Springs, Kan., plant. A newspaper carried a photo of plant employes posting numerals on a large billboard carrying the message, "The safest cement plant in the United States—no lost-time injury for 3,236 consecutive days."

Lime-stabilized soils are subject of research project

A BASIC STUDY OF THE REACTION between lime and minerals commonly found in soils will be undertaken at Lehigh University, Bethlehem, Pa., under a National Science Foundation grant. A sum of $19,900 has been provided for the project titled "Pozzolanic reaction of common soil minerals." Dr. Roy J. Leonard, assistant professor of civil engineering and former research engineer for the Bureau of Public Roads, will direct the study.

The research is aimed to explain how certain soils stabilized with lime will behave under given field conditions of temperature and load changes, and to determine the mechanism and nature of the reaction products of the lime-soil mineral reactions.

The study may show how the reaction may be stimulated or controlled and the results improved. "Depletion in several physiographic regions of natural materials suitable for use as base course in highway and airport pavements makes it appropriate to

(Continued on page 78)

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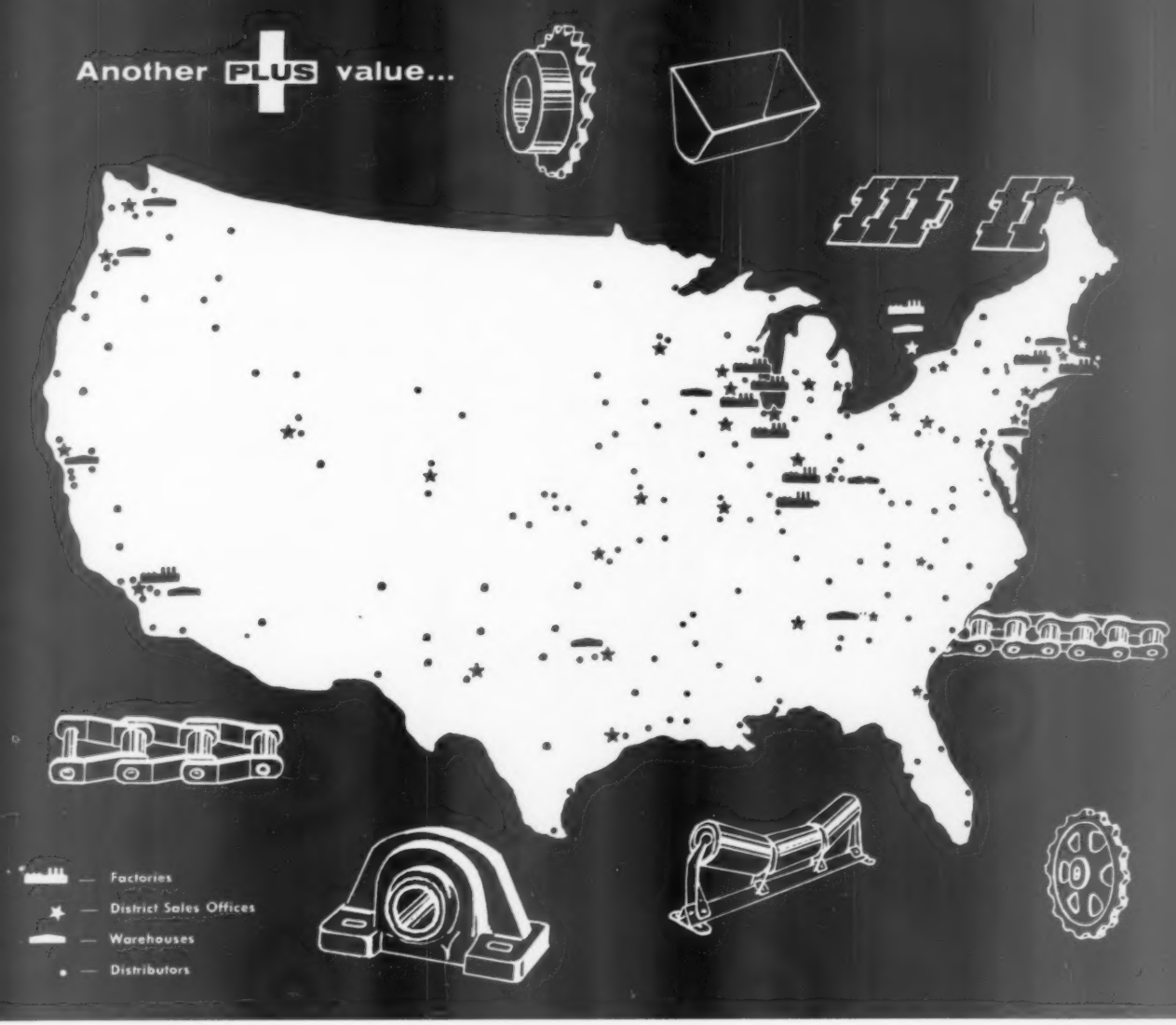

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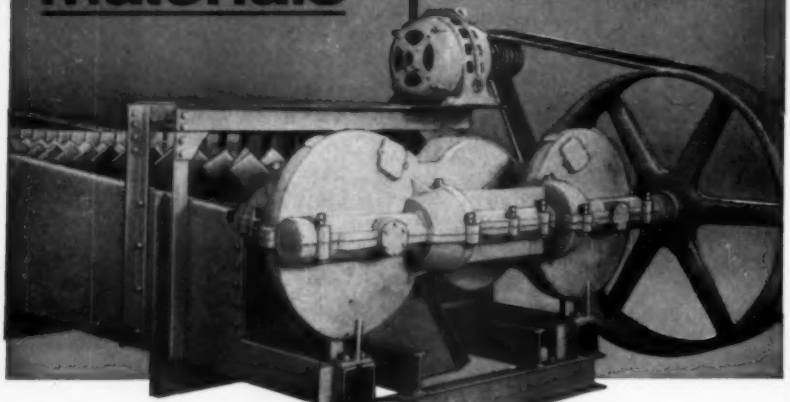

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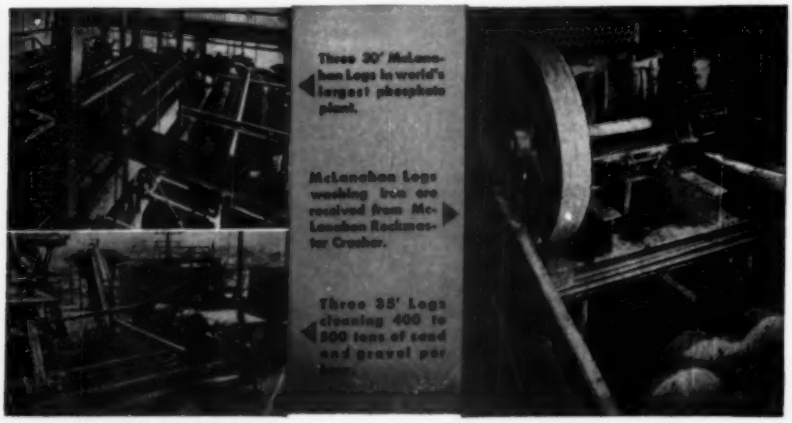
Three 30' McLanahan Logs in world's largest phosphate plant.
McLanahan Logs washing iron ore received from McLanahan Rockmaster Crusher.
Three 35' Logs cleaning 400 to 500 tons of sand and gravel per hour.

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INDUSTRY NEWS

(Continued from page 76)

consider closely the application of soil stabilization," said Dr. Harvey A. Neville, director of Lehigh's Institute of Research.

Oklahoma Cement sets up offices, starts sales work

LOOKING FORWARD TO CEMENT PRODUCTION in May, Oklahoma Cement Corp. has set up executive offices in Tulsa and has begun sales work. This selling activity is under the direction of Hugh Wien.

George A. Fuller Co. is building the new $7-million cement plant near Pryor. Consulting engineer and project manager for the 1-million bbl. dry process plant is A. J. Anderson.

Report on fly ash—"construction cinderella"

WEST PENN POWER Co., Greensburg, Pa., in a recent issue of West Penn News, reports continuing research on fly-ash concrete. A new development is a concrete mix with fly ash for the "do-it-yourself" market. It is sold under the brand name of Home-Crete.

Comparison tests made jointly by West Penn and Burrell Construction and Supply Co., its sales agent for fly ash, are reported to show that concrete using fly ash as a binder has these advantages over standard building concrete: greater strength, lower water permeability, less water absorption, easier handling and placement, less shrinkage and greater resistance of acids, sulfates and salt water.

The company is using fly-ash concrete or asphalt mixture in nearly all its construction. Driveways, parking lots and operation centers are some of the projects. Several mine ventilating shafts are incorporating fly-ash concrete, and West Penn customers use it in smaller commercial bulk for block, septic tanks, burial vaults and water tank heater linings. The company credits research and a growing acceptance of fly ash making it the "cinderella product of the construction industry."

Kaolin found

A KAOLIN DEPOSIT approximating 15.9 million tons has been discovered on property belonging to W. K. Price,

Jr., between Leesburg and Okahumpka, Fla. Businessmen in the Lake County area are hopeful that a pottery or chinaware manufacturer will build a plant nearby. In that way, transportation costs could be avoided and a market provided to make development of the deposit profitable. Persons associated with the Florida kaolin industry recall that the early failure of some kaolin mines in Central Florida was due to the expense of mining and transportation.

McDonough Enterprises buys sand and gravel companies

BERNARD P. MCDONOUGH ENTERPRISES, Parkersburg, W. Va., has purchased the Ohio River Sand & Gravel Corp., Parkersburg, and the Iron City Sand & Gravel Corp., Pittsburgh, Pa. Mr. McDonough also is owner of Kanawha Sand Co. of Parkersburg.

A reader writes . . .

Editor:

"In one of your recent issues of ROCK PRODUCTS the advantages of the new grate invented by Dr. Spohn were given well deserved prominence. No doubt you will be interested to learn that my company installed a Loesche vertical kiln with the conventional grate and is now in the process of converting it to the Spohn system of interground fuel. We anticipate that the new method will be in full operation within four or five weeks. Dr. Spohn and Mr. Loesche of Dusseldorf will be visiting New Zealand to ensure that the new grate gets away to a good start.

"For your information I may say that my company commenced operations 2½ years ago and experienced many difficulties. Under the subsequent guidance of Loesches' these problems were quickly overcome and the company has prospered. With the correct skill and equipment there is no doubt as to the economy of Loesche vertical kilns.

"Incorporation of the Loesche/Spohn process into our plant is estimated to increase our kiln production from between 30,000 to 40,000 tons to between 75,000 to 80,000 tons. The process will not only give higher quality clinker and simplification of control but obvious cost advantages which are of the highest importance."

C. M. Richwhite, Chairman of Directors

Waitomo Portland Cement Ltd., Aukland, New Zealand

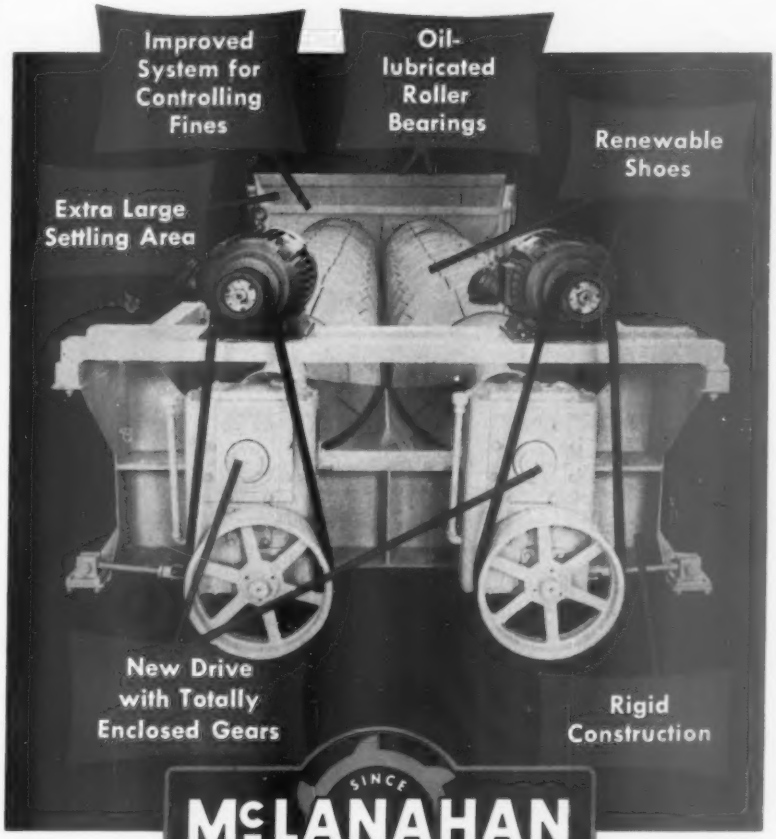
(Continued on page 82)

PROFITABLE TONNAGES

of cleaner, drier product

Greatly improved drive with direct shaft mounted reducers . . . more effective performance in a broad range of operating conditions . . . heavier construction for longer service—these fundamentals make McLanahan Single or Double Screw washers your soundest buy.

Write for New Bulletin.



SCREW WASHERS

McLANAHAN & STONE CORPORATION

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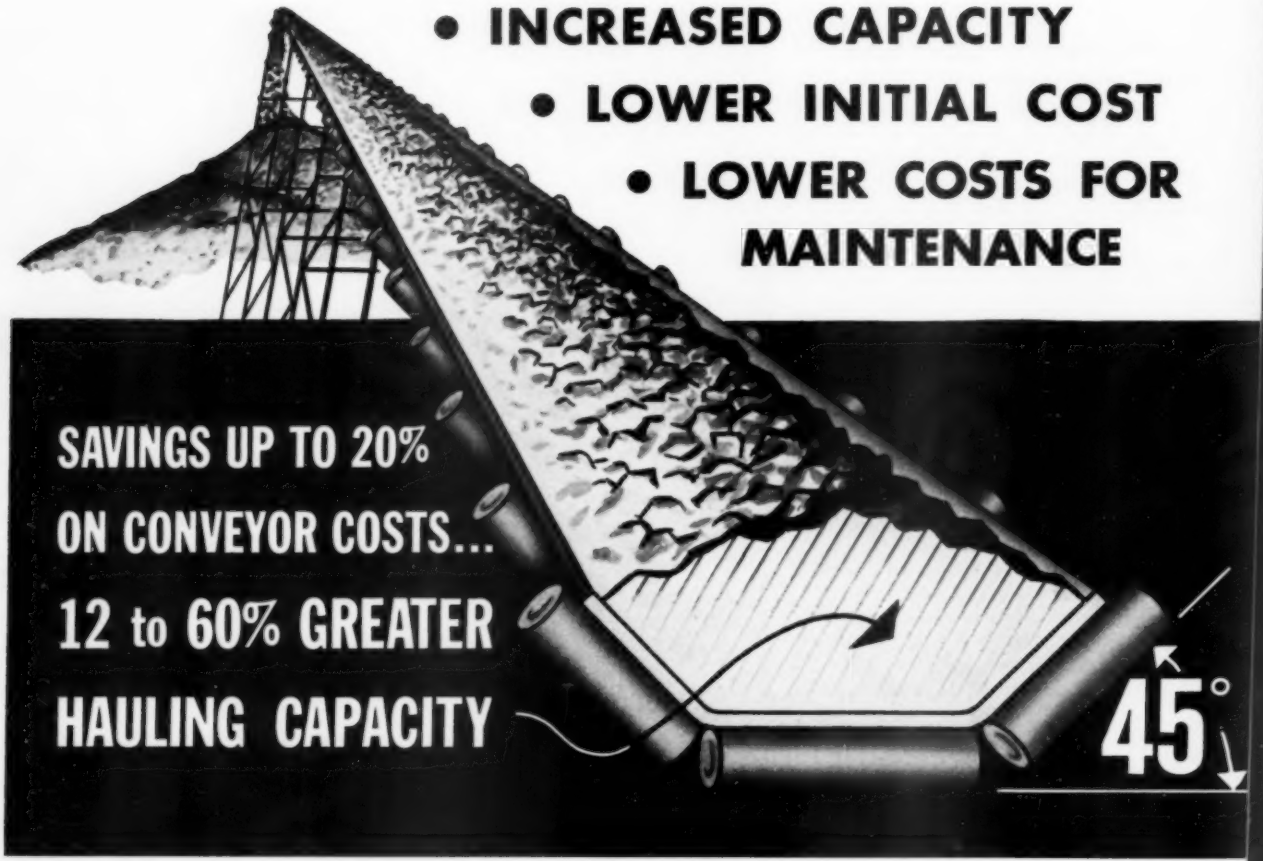
MOST IMPORTANT NEWS

NOW YOU CAN USE 45° IDLERS

- INCREASED CAPACITY
- LOWER INITIAL COST
- LOWER COSTS FOR MAINTENANCE



It's a mathematical certainty that a belt can haul bigger loads with 45° idlers than with regular 20° idlers. But the 45° angle between concentrating idlers and bottom roll idlers is too sharp for an ordinary heavy duty conveyor belt. Plies separate, but modern RAY-MAN CONVEYOR BELT licks this problem . . . for all time!

Ray-Man's exclusive flexible construction and built-in stress compensation is guaranteed to take the sharp angle of 45° idlers without ply or cover separation at the hinge line. This opens a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors . . . assuring longer cover wear . . . lower handling costs!

RAY-MAN GIVES YOU "*MORE USE PER DOLLAR*" WITH 45° IDLERS

IN CONVEYING TODAY!

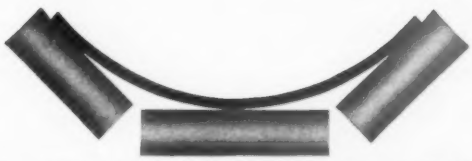
...TO HANDLE ALL MATERIALS

BIGGER LOADS, LESS SPILLAGE, LESS WEAR ON COVER WITH 45° IDLERS

20° IDLERS REQUIRE WIDER CONVEYOR TO HAUL SAME TONNAGE

Only RAY-MAN CONVEYOR BELT is BUILT to take the EXTRA STRESS OF 45° IDLERS

RAY-MAN IS GUARANTEED NOT TO PLY-SEPARATE AT 45° ANGLES



ORDINARY PLY BELTS ARE TOO BOARDY TO TAKE 45° ANGLES

Ask your R/M representative to show you how Ray-Man Conveyor Belt with 45° idlers can give you the most for your conveyor dollar . . . write for new Bulletin M303, "Ray-Man for 45° Idlers."

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM

RM-961
ENGINEERED RUBBER PRODUCTS ... MORE USE PER DOLLAR

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"THIS LUBRICANT SAVED US $2,098·16 IN SEVEN MONTHS"

—says THE BROWN COMPANY
Quality Paper Makers of Berlin, N. H.

"During a seven-month period before using LUBRIPLATE No. 130-AA in the bearing of our Kraft Mill Lime Kiln, we used a conventional oil at a cost of $2,134.00. In the seven months that followed, we used LUBRIPLATE No. 130-AA for initial filling and replacement at the cost of $35.84."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

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CALENDAR

OF COMING EVENTS

February 15-19, 1960
National Sand & Gravel Association, Convention & Exposition, Conrad Hilton Hotel & Coliseum, Chicago

February 22-24, 1960
National Crushed Stone Association, Annual Convention & Exposition, Conrad Hilton Hotel, Chicago

April 28-30, 1960
Texas Aggregates Association, sixth Annual Convention, Hilton Hotel, El Paso, Texas

April 28-30, 1960
The American Institute of Mining, Metallurgical and Petroleum Engineers, Pacific Northwest Metals and Minerals Conference, Sheraton Hotel, Portland, Ore.

May 17-19, 1960
Cement Industry Subcommittee, American Institute of Electrical Engineers, Technical Conference, Pfister Hotel, Milwaukee, Wis.

May 23-25, 1960
National Lime Association, 58th Annual Convention, The Cloisters, Sea Island, Georgia

June 26—July 1, 1960
ASTM annual meeting and apparatus exhibit, Chalfonte-Haddon Hall, Atlantic City, New Jersey

INDUSTRY NEWS

(Continued from page 79)

Accident frequency rates tallied for rock industries

IN REPORTING ACCIDENT frequency and severity rates in 40 major industries, National Safety Council rated the cement industry 7th safest from the standpoint of number of accidents, but 33rd in number of work-days lost. With 171 U. S. plants reporting, the cement industry had 3.30 disabilities per 1 million man-hours; 1,428 work-days were lost for the same period.

The quarry industry, with 287 plants reporting, had 11.95 disabilities per 1 million man-hours. This was high, ranking 33rd in the list of 40; severity rate also was high—with 4,168 days charged per 1 million man-hours, it ranked 39th.

These injury rates for the year 1958 showed the following percentage changes from 1957: cement industry frequency rate, up 17 percent; severity rate, up 11 percent; quarry industry frequency rate, down 12 percent; severity rate, up 61 percent.

Construction contracts drop nine percent in November

F. W. DODGE CORP. reported a nine-percent drop in total construction contracts in November, traceable to a decline in highways and housing. Contracts for future construction amounted to $2,372,826,000, down about $220 million from November 1958. Offsetting partially the effect of the decline in housing and highways was the increase in contracts for manufacturing buildings. They rose about $87 million over year-earlier figure.

END

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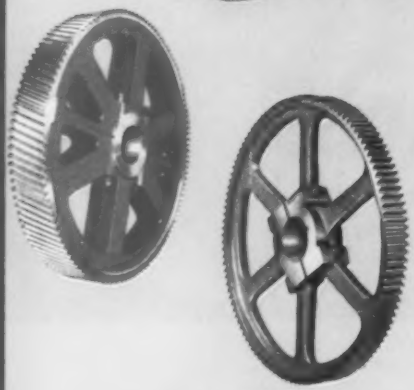
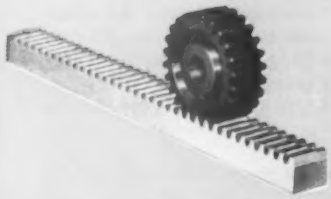
The Stamp of Final Approval on ILLINOIS GEARS

ILLG

International SYMBOL of QUALITY





This symbol of quality on ILLINOIS GEARS has earned extraordinary confidence on the part of gear users throughout the world. It is emblematic of the high standards of precision and quality that characterize every step in the manufacture of ILLINOIS GEARS.

In fact, so painstaking is this control of quality that each and every gear must pass a great many exacting inspections before it has earned the right to carry this stamp of final approval... your assurance of the *very finest gears in the world!* In the unmatched facilities of ILLINOIS GEAR one machine out of every six... and one man out of every ten are devoted to quality control.

If you are not now using or specifying ILLINOIS GEARS we invite you to profit from this rich heritage of quality that has established a new concept in gear manufacture.

Look for this mark ILLG® *the symbol on finer gears*

ILLINOIS GEARS Reg U.S. Pat Off.

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

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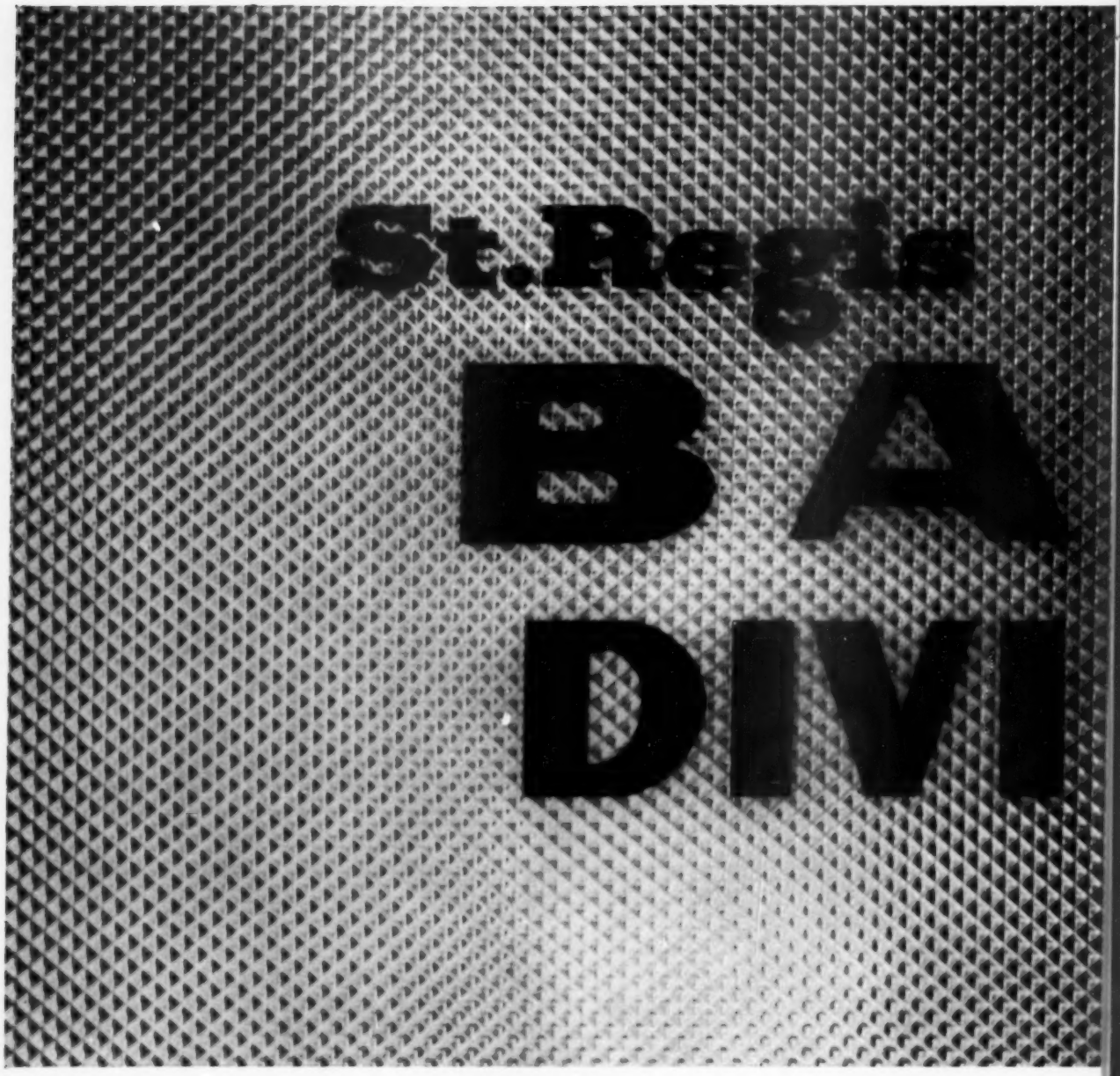


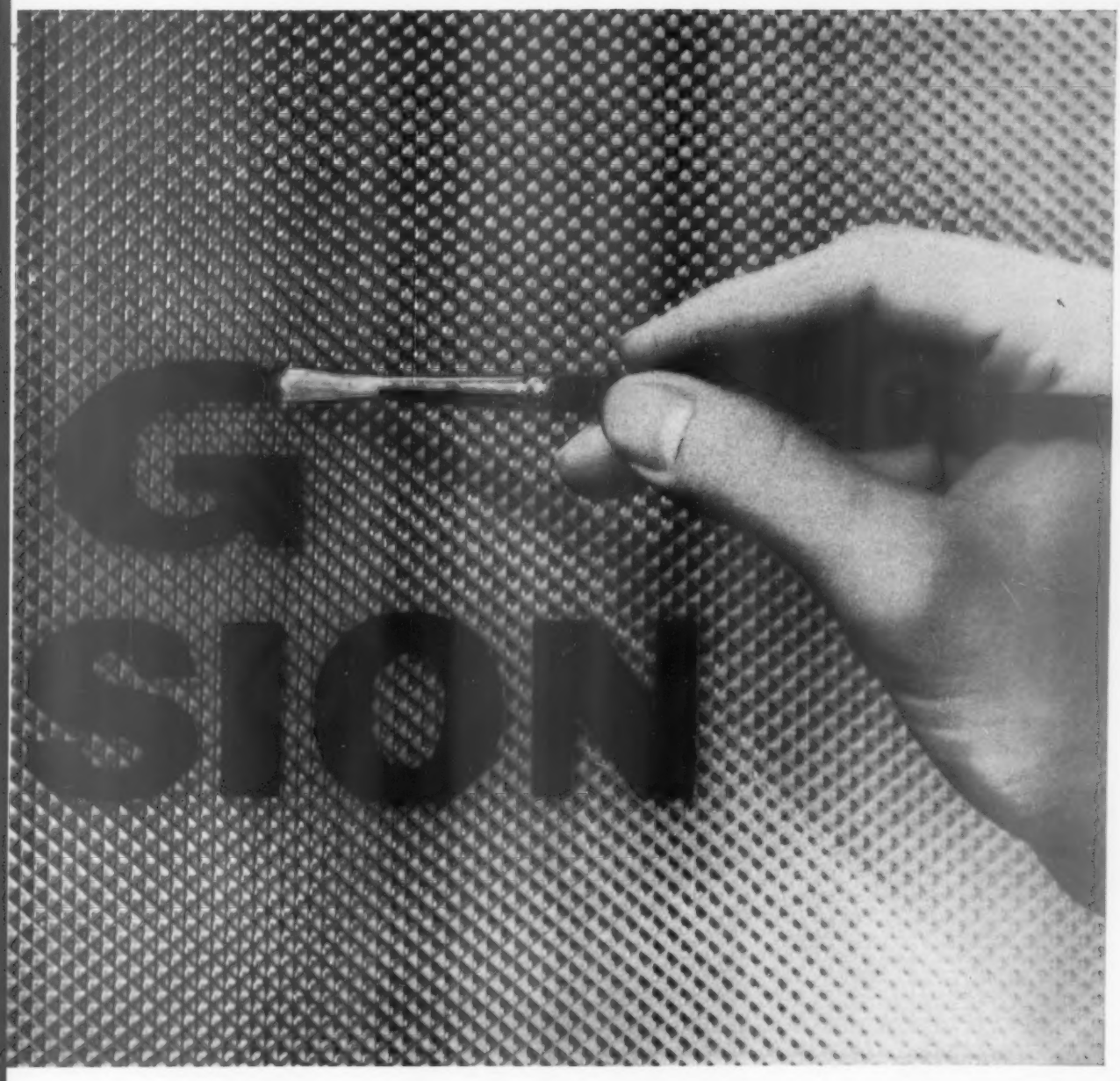
We shortened the name... and enlarged our services

It takes only a matter of minutes to change the name on an office door. But it took months of planning to organize St. Regis' all-out program to meet the ever-changing needs of our shipping bag customers. Now, with expanded facilities, we're prepared to serve you better than ever before.

The new St. Regis Bag Division was developed to provide you with four important services: *the right bag* for your product, *the best equipment* to fill it, *an engineering staff* to help reduce your over-all packaging costs, and, wherever possible, *new packaging systems* and methods.

It's so complete in every way, we call this new program *Packaging-In-Depth.*

It was made possible by consolidating St. Regis'



basic Multiwall organization with four highly-successful and respected paper and textile bag companies. We now offer a *complete* product line: multiwall, burlap, textile, mesh . . . whatever you need. We now have *13 manufacturing plants* for more efficient coverage of key areas throughout the country where industries depend on bags for shipping their products. In these areas, a complete staff of packaging engineers is ready to give you skilled service quickly.

Our research and development facilities are now available to all segments of the new Bag Division, to explore and perfect the most advanced, most efficient packaging methods.

One thing more. The people who *make* your bag are best qualified to supply the bag filling and closing machinery for your operation. St. Regis actually designs and produces the most complete line of packaging machinery in this field: more than 50 different models.

To sum up: more *diversified* services to offer . . . more *specialized* people to meet your needs. And though our men have *years* of experience in many fields, the spirit of St. Regis' new Bag Division is young and eager. We look forward to serving you soon.

BAG DIVISION

St.Regis PAPER COMPANY

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Chemical Packaging Company • Mid-America Bag Division

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HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Cobbles in your bottom-dump?

THIS PROBLEM was eliminated deftly at one midwestern gravel plant by installing these steel plates in the shovel bucket. About 10-12 in. apart, they insure that the gravel plant's bottom-dump pit trucks will have no dumping problems. Too, they've eliminated the need for a scalper (or up to three pickers) to remove the cobbles too large for the primary crusher to handle. No sticking of pit-run in the bucket has been encountered, reports the inventor of the idea.

"Heat" control on welding generators

FIELD WELDING GENERATORS often are mounted on heavy trucks with high frames, well beyond the easy reach of the welder on the ground. To save the effort of climbing the short stairs on the truck body each time adjustment of the amperage was made, an extension rod fashioned of ¼ in. diam. bronze rod was made. Its 18-in. length permitted ready control of the generator output with a minimum of effort. The control itself has sufficient drag to remain fixed in any adjusted position in spite of the weight of the rod tending to swing to the plumb position. At the same time, the size of the rod makes it easy to check the amperage setting anywhere within reach of the weld cables.

Paul C. Ziemke, Clinton, Tenn.

No shanty towns wanted

THE CRUDE, WOODEN SHANTIES set up in many a rock products plant in the cold winter months can be a serious fire hazard. This is especially true when primitive stoves are carved out of oil drums or scrap sheets. An Eastern producer called this hazard to the attention of those who attended the recent National Safety Congress.

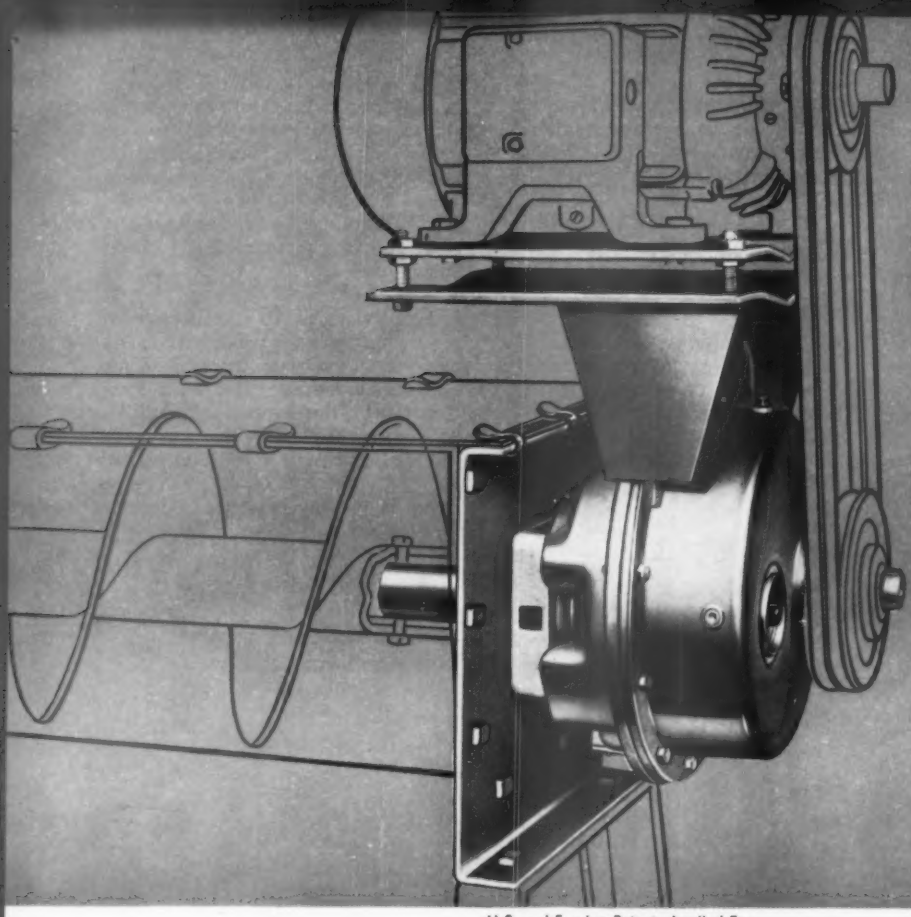
Even the simple portable oil and electric heaters often used in these locations are a great danger. At least one man was burned to death last winter in one of these cubicles.

Your men will probably find materials to build shelters if they are not provided. So it's wise to anticipate their needs by building and equipping safe shelters out of corrugated steel or to purchase a prefabricated unit with safe heating elements.

Keep that primary operating at peak efficiency!

THIS BIG 4265 primary gyratory crusher is fed about 1,000 tph., and must be kept operating for maximum efficiency. So the producer, at a big special aggregates operation in the East, stations two men at the primary to insure an even feed rate and eliminate clogging. Behind the screen at the back end of the crusher hopper, one man signals truck drivers when to dump, to work the gyratory at maximum safe speed. The second man operates a truck-mounted crane equipped with the orange-peel grapple shown. He makes sure that large chunks of the very hard diabase trap rock drop into the crushing chamber smoothly and don't halt operations. The extra expense is worthwhile when you have four shovels and 11 quarry trucks to keep busy!

(Continued on page 88)



NEW! FALK Screw Conveyor Drive

U.S. and Foreign Patents Applied For

—the drive our customers asked for

Our customers helped us design this new unit. We sent our men into the field to find out what our customers needed in a screw conveyor drive—then our engineers designed a new drive that offers the maximum of service, versatility, operating economy and long life. Here are some of its outstanding features:

A COMPLETE DRIVE: Saves engineering and assembly time. Six sizes to cover entire range—each with these ratios: — 4:1, 9:1, 14:1 and 24:1. Bolts to any standard trough end—eliminates trough end bearing. Eliminates drive shaft wobble. Efficient FALK single helical gears.

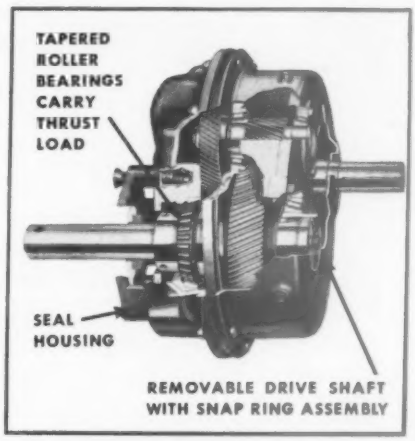
SEAL HOUSINGS: Choice of seals (neoprene or leather lip, felt or waste) to accommodate material conveyed. Space between trough seal and unit seal prevents conveyed material from reaching unit seal.

REMOVABLE DRIVE SHAFT: Snap ring assembly permits easy removal. Five sizes, from 1½" to 3⅞".

TROUGH END: Can be fastened to any standard trough. Eight sizes, from 6" to 20".

ALL-STEEL MOTOR MOUNT: Saves costly engineering and installation time and costs; no motor plates to design or fabricate. Motor can be mounted in virtually any position. Pre-drilled to accommodate NEMA standard motors ½ to 30 HP.

AN IMPORTANT ECONOMY: Buy only what you need—the basic reducer alone, or with trough end and/or motor mount. For detailed information, contact your Falk Representative or Distributor—or ***write direct for Bulletin 7106.***



THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in most principal cities

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FALK

...a good name in industry

(Continued from page 86)

Quick screen change

A QUICK, LOW-COST WAY to save a screen change when you want to retain more fines: lay a piece of rubber (a "rubber blanket," the producer terms it) over part or all of the lower decks. This will retain fines, carrying them off the end of the vibrator with the plus sizes. Being resilient, the rubber doesn't wear quickly. And it is light enough for one or two men to handle easily. This producer has cut it in 2 and 3-ft. wide strips, to retain varying percentages of fines, depending on specifications.

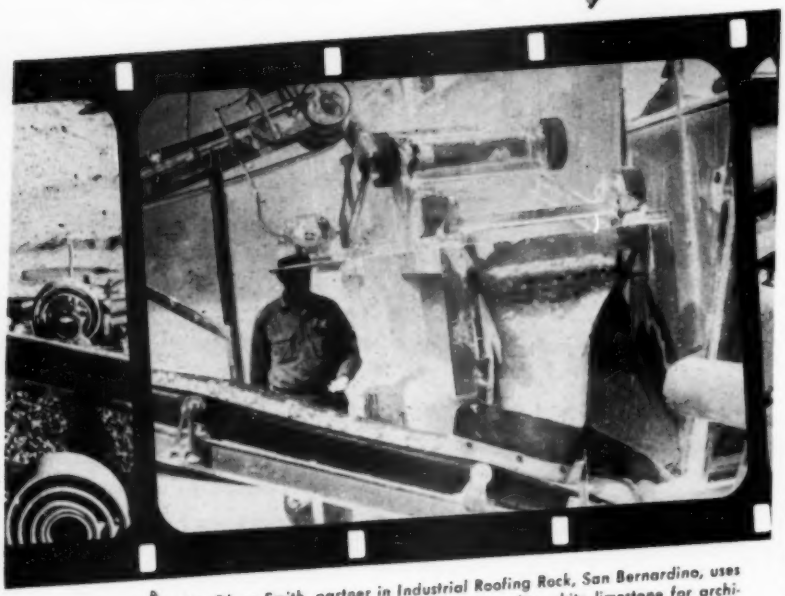
Slurry pump

WHEN A SOUTHERN rock products producer discovered that his tailings pond was filling up extremely rapidly, it became necessary to prevent it from filling completely.

The successful solution to the problem proved to be a pump mounted on an oil-drum raft. But the details weren't quite as simple. Since the suspended solids had already settled into a heavy, gummy mass, it was necessary to mount a pair of high-pressure jets ahead of the pump opening. The jets loosen the material and make it liquid enough to flow freely into the pump.

Another ingenious detail was to mount the pump and motor assembly on a hinged bedplate. One end of the plate is suspended from an I-beam framework with a wire rope and a hand-operated winch. Now the pump can be lowered into the slurry just enough to pump efficiently. The pump transfers the sludge about 500 ft. to fill areas.

Screen Story...



Mr. Glenn Smith, partner in Industrial Roofing Rock, San Bernardino, uses two Overstrom Screens to produce high-quality white limestone for architectural and fine plaster products. One of the two 3' x 10' double-deck machines is equipped with dust enclosure and ball cleaners to produce 16 x 40m. and minus 50m. products efficiently and without blinding.

Loves tough going! Overstrom Vibrating Screens are *quality* equipment designed and built to out-perform any other machine at any given job. Plan for an Overstrom in your next installation. You'll see the difference in higher screening efficiency and a better product . . . (Like to see more pictorial examples of *"Overstrom On The Job"?* Drop us a line and we'll add your name to our mailing list.)

OVERSTROM VIBRATING SCREENS

OVERSTROM & SONS, INC • 2213 West Mission Rd • Alhambra, California

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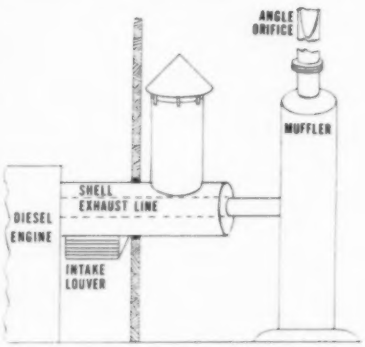
Galvanized shell protects diesel exhaust pipe



A LARGE, STANDBY diesel-powered generator has its red hot exhaust pipe protected and cooled by enclosing it in a galvanized metal shell. This is placed about the line and vented to develop an effective updraft to the outdoor stack.

The sheet metal case about the exhaust is made in two parts, provided with flanges to permit assembly with equally spaced bolts. To maintain sufficient air movement, the radius of the shell should be approximately 4 in. larger than the exhaust. The metal louvre is mounted on the shell near the engine for the make-up air entry.

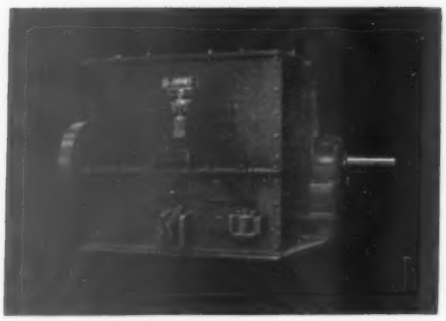
The slip joints of the shell are fastened with hard solder. Brackets are placed at equal distances on the interior of the shell to maintain uniform annular spacing throughout.

Since the exhaust gases range from 500 to 900 deg. F., the completed job is incased in ¾-in. asbestos-magnesium type pipe covering to reduce room temperatures and to reduce the load on the air conditioning equipment.

Paul C. Ziemke, Clinton, Tenn.

END

Jeffrey Pulverizer crushes fluxstone fine for efficient sintering



The Jeffrey Type B Pulverizer has many advantages in crushing fluxstone for sintering operations. It crushes *fine* – standard 3/8", or 1/8", when required. This is possible since the material goes through several changes in direction and several hammer contacts before it reaches the screen bars.

This unit is reversible, designed for heavy duty work, is dust-tight, and has hydraulic adjustments. Power requirements are less than with other units, since most of the work on the material is done before the material reaches the screen bars.

Fluxstone is but one of hundreds of materials which can be efficiently reduced with Jeffrey Crushers... from alum and asbestos to rock and slag. For complete information check your nearest Jeffrey sales engineer. The Jeffrey Manufacturing Company, 935 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT... TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

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CONGRESSMAN HOWARD BAKER (TENN.) SAYS: "Work through your able industry representatives and through direct approach to your elected representatives in the Congress on behalf of your convictions on the subject of percentage depletion. You *must* do this if you would help those of us in Congress who want to help you in the conservation and proper utilization of our natural resources."

What you should know about percentage depletion

by Joseph N. Bell

LAST JUNE, the U. S. Circuit Court of Appeals for the Southern District of Indiana handed down a verdict in the case of the Cannelton Sewer Pipe Co. of Cannelton, Ind., vs. the United States of America. The case was another of the dreary arguments that have dragged on interminably over the past five years on the proper cut-off point for figuring percentage depletion. As in every other ruling so far on this matter, the court found for the taxpayer.

On the surface, the whole affair simply sounds like another episode in the apparently endless serial entitled, "We'll get you yet," featuring the ever-hopeful and unflinchingly-courageous guardians of the U. S. Treasury.

This is one instance, however, where rock producers should look beyond the surface implications. The Cannelton case is of particular importance to the rock industry for three reasons:

—The Treasury, which has been remarkably inept in presenting its side of the depletion argument in previous lawsuits, laid aside some of its stock arguments and did some fresh thinking.

—In view of these changed tactics, the Treasury

How, when and why did percentage depletion start? When did the rock industries come into the depletion picture? What does the record indicate the "intent of Congress" to have been?

has prepared a writ of certiorari, a review of the lower court decision by the Supreme Court—and, in the opinion of some of the legal experts in the rock industry, has a reasonably good chance of winning such a review with its fresh approach to a tired problem.

—If Treasury should win a verdict—any verdict—on its interpretation of what constitutes a "commercially marketable product," its position would be strengthened considerably in its demands for hardening of percentage depletion regulations in the bill now pending before the House Ways and Means Committee. And even if it loses the Cannelton case, it is apparently better armed and ready to do battle elsewhere until the law is finally clarified by Congress or the courts return a favorable decision for Treasury.

In rendering the Cannelton verdict, Circuit Judge Hastings said: "The Government has attempted, in a number of cases and with conspicuous lack of success, to limit the scope of the definition of mining . . . . Courts of Appeals in four different federal judicial circuits have uniformly and unhesitatingly rejected such endeavors to narrow the application of the provision's language.

"In all the above cases, the government's basic contention was that manufacturing processes could not be ordinary treatment processes within the meaning of the code. Likewise, in each of these cases, the government readily admitted that each taxpayer had no market, or a market for only a negligible quantity of the particular raw material involved; but urged that this fact was of no consequence since the overriding consideration was that depletion could not be allowed on the sale of manufactured products.

"That argument has definitely been laid to rest; the government has not renewed it before this court."

Why should the sharpening of the government's legal claws in the Cannelton case be important to you? It's important because many millions of dollars are up for grabs between the Internal Revenue Service and rock products producers in the percentage depletion squabble—and some of those dollars are yours.

The Treasury will cut back as far as it can and as hard as it can on percentage depletion—of this, you can be sure. If it gets a favorable court decision—and industry persists in what some members of Congress look upon as unreasonable demands, they're likely to find some receptive ears in Congress.

Congressman Howard Baker of Tennessee said recently to the American Mining Congress: "The concept of percentage depletion has spread in its applicability in the face of strenuous opposition by its opponents. Today it is estimated that approximately $3.5 billion is taken annually as depletion deductions by corporations, individuals and partners. Depletion has become the revenue source that the social do-gooders turn to for the money to finance the government spending schemes that they are advocating. These social do-gooders attempt to assume a mantle of fiscal responsibility by offsetting the millions and perhaps billions that they would spend of the taxpayers' money by seeking to raise funds through the elimination or reduction of the depletion deduction."

What can you, as an individual rock products producer, do about this situation? Congressman Baker says: "Work through your able industry representatives and through direct approach to your elected representatives in the Congress on

Please turn page

■ *During the summer of 1959, while the percentage depletion hearings were taking place in Washington, the Marquette Cement Manufacturing Co. of Chicago had prepared for its own internal use a factual legislative history of depletion allowance, with emphasis on "gross income from the property." Marquette officials have generously made this document available to* ROCK PRODUCTS; *the calendar of meaningful dates in percentage depletion history, contained in this article, is based on the Marquette material.*

WHAT YOU SHOULD KNOW ABOUT PERCENTAGE DEPLETION

continued from page 91

behalf of your convictions on the subject of percentage depletion. You must do this if you would help those of us in the Congress who want to help you in the conservation and proper utilization of our natural resources."

In order to work intelligently in this direction, you should know something about the background of percentage depletion. How, when and why did it start? When did the rock industries come into the depletion picture? What does the record indicate the "intent of Congress" to have been?

To help you answer these questions and perhaps provide a better factual base for your understanding of percentage depletion, ROCK PRODUCTS has put together the following calendar of main events in the life of the depletion concept. The calendar is necessarily abbreviated, but the salient landmarks are here.

1909—The Corporation Tax Law recognized, for the first time, the deduction of ordinary and necessary expenses, including "a reasonable allowance for depreciation of property."

1913—The Supreme Court ruled that Congress could constitutionally measure a tax by the income from mining without making any allowance for the diminution of the ore body. This established the principle that depletion is a matter of legislative grace. However, the Supreme Court also strongly implied that in equity and fairness Congress should allow depletion even though the Constitution didn't compel it.

1916—The Revenue Act of 1916 provided a "reasonable allowance for depletion not to exceed the market value in the mine of the product thereof." The same act provided that when total depletion allowances equal capital originally invested or March 1, 1913, value (the effective date of the income tax amendment) no further allowance shall be made.

1918—The Revenue Act of that year dropped the provision halting depletion deductions after recovery of cost of 1913 value. For the first time, Congress provided for "discovery depletion"—permitting a taxpayer who discovered "mines, oil and gas wells" to base the depletion allowance on the fair market value of the property within 30 days of the date of discovery.

1921—The Revenue Act limited discovery depletion to "net income, computed without allowance for depletion, from the property upon which the discovery is made." Three years later, the discovery depletion allowance was limited to 50 percent of the net income from the property on which the discovery is made.

1926—An important change in depletion theory took place. Percentage depletion was provided for oil and gas wells at the rate of 27½ percent of the gross income from the property (limited to 50 percent of the net income). Discovery depletion was allowed only to the taxpayer who discovered the minerals, while percentage depletion was allowed whether or not the taxpayer was also the discoverer.

The 1926 Revenue Act also recognized for the first time discovery depletion for mines in which the taxpayer discovered minerals in commercial quantities where the vein wasn't simply the extension of a known deposit (and if the discovered minerals were of sufficient value and quantity to be mined separately at a profit).

1932—Congress provided percentage depletion for coal mines (5 percent), metal mines (15 percent) and sulfur (23 percent)—based on a given percentage of "gross income from the property."

This phrase was to provide recurring headaches for all concerned for several decades. After a series of conferences between Treasury officials and the American Mining Congress, "gross income from property" was defined in Treasury regulations as:

—amount for which the product sold at the cut-off point;

—the representative market or field price at that point if the product was further processed;

—if there was no representative price at the cut-off point, and the mineral was processed beyond, then the amount for which the ultimate product was sold, minus disallowable processing costs.

Allowable processes in arriving at the cut-off point were then enumerated for coal, sulfur, iron ore, lead, zinc, copper, gold and silver.

1939—Gross income definition was revised to provide that, where a mineral was processed beyond the cut-off point (with no representative price at that point), not only the costs but also the profits attributable to the disallowable processes must be deducted from the selling price of the ultimate product to arrive at gross income.

1943—The Revenue Act of this and the previous year granted percentage depletion to a broad range of additional products including fluorspar, ball and sagger clay, rock asphalt, flake graphite, vermiculite, beryl, feldspar, mica, talc, lepidolite, spodumene, barite and potash. The allowance was to terminate at the end of the war, but this was repealed in 1947.

Also in 1943, another portentous phrase entered the Congressional lexicon: "ordinary treatment process." A section added to the Treasury Code by Congress provided:

"The 'gross income from the property' means gross income from mining. The term 'mining' as used herein shall be considered to include not merely the extraction of the ores or minerals from the ground but also the ordinary treatment processes normally applied by mine owners or operators in order to obtain the commercially marketable mineral product or products.

"The term 'ordinary treatment processes,' as used here, shall include the following: . . . . in the case of . . . . ores which are not customarily sold in the form of the crude mineral product—crushing, grinding and beneficiation by concentration . . . . cyanidation, leaching, crystallization, precipitation, or by substantially equivalent processes used in the separation or extraction of the product or products from the ore."

The House added a clarification in its Conference Report on the Revenue Act of 1943. It stated that the House agreed to the Senate amendment, but only with certain changes. One important change was "an amendment excluding . . . roasting, thermal or electric smelting and refining from the definition of 'ordinary treatment processes.' "

1951—The Revenue Act of 1951 established a new group of minerals to which percentage depletion was available at the rate of 5 percent. The group included: sand, gravel, stone, brick and tile clay, shale, oyster shell, clam shell, granite, marble and asbestos. It also added a list of nonmetallic minerals at a 15-percent rate including: borax, fuller's earth, tripoli, refractory and fire clay, quartzite, perlite, diatomaceous earth, and metallurgical and chemical grade limestones. This action came after two years of including and then eliminating in conference (mainly because of revenue needs arising from the Korean War) many of these same materials.

During the discussions leading up to this act, a report of Senate Finance Committee noted:

"It is not proposed to allow percentage depletion with respect to the value added as the result of grinding or other special preparation because many of the extractors do not themselves carry on this process, but rather sell these minerals in crude form and let others carry on any processing required. Thus, to allow percentage depletion with respect to this added value would discriminate against those selling these minerals in crude form, since percentage depletion is not allowable to these processors."

The 1951 act also included a provision stating, in substance, that up to 50 miles of transportation to the treatment plant could be included in gross income for depletion purposes. Revenue losses to the government as a result of the expansion of the principle of percentage depletion in the 1951 act were estimated at $76 million a year.

1954—In 1954, the "ordinary treatment process" argument really began to wax hot. A Joint Committee on Internal Revenue Taxation prepared a report that stated: "It is understood that, in determining the gross income . . . . the Bureau of Internal Revenue contemplates only taking into account the value of the raw clay itself."

Repercussions were immediate. Witnesses from various affected industries began to ask that specific additional processes be included in the definition of "ordinary treatment processes." The crushed stone industry, for example, contended that exclusion of "fine pulverization" from "ordinary treatment processes" is inequitable.

After extensive hearings, the House Ways and Means Committee defined gross income from property as "gross income from mining, and 'mining' in turn is defined as the extraction of the minerals, ordinary treatment processes normally applied to obtain commercially marketable mineral products and certain transportation."

Specifics were still sadly lacking in the 1954 Internal Revenue Code—and this situation has precipitated thousands of arguments between the Treasury Department and taxpayers, and has cost millions of dollars both to the government and individual taxpayers in legal and court fees.

Obviously Congress has failed, in many important instances, to spell out its intent with respect to the cut-off point of the minerals which were added to the percentage depletion list after 1943—a group including most of the rock industries.

Since the 1954 act, any additions or deductions to the body of information on percentage depletion has consisted almost entirely of interpretations by

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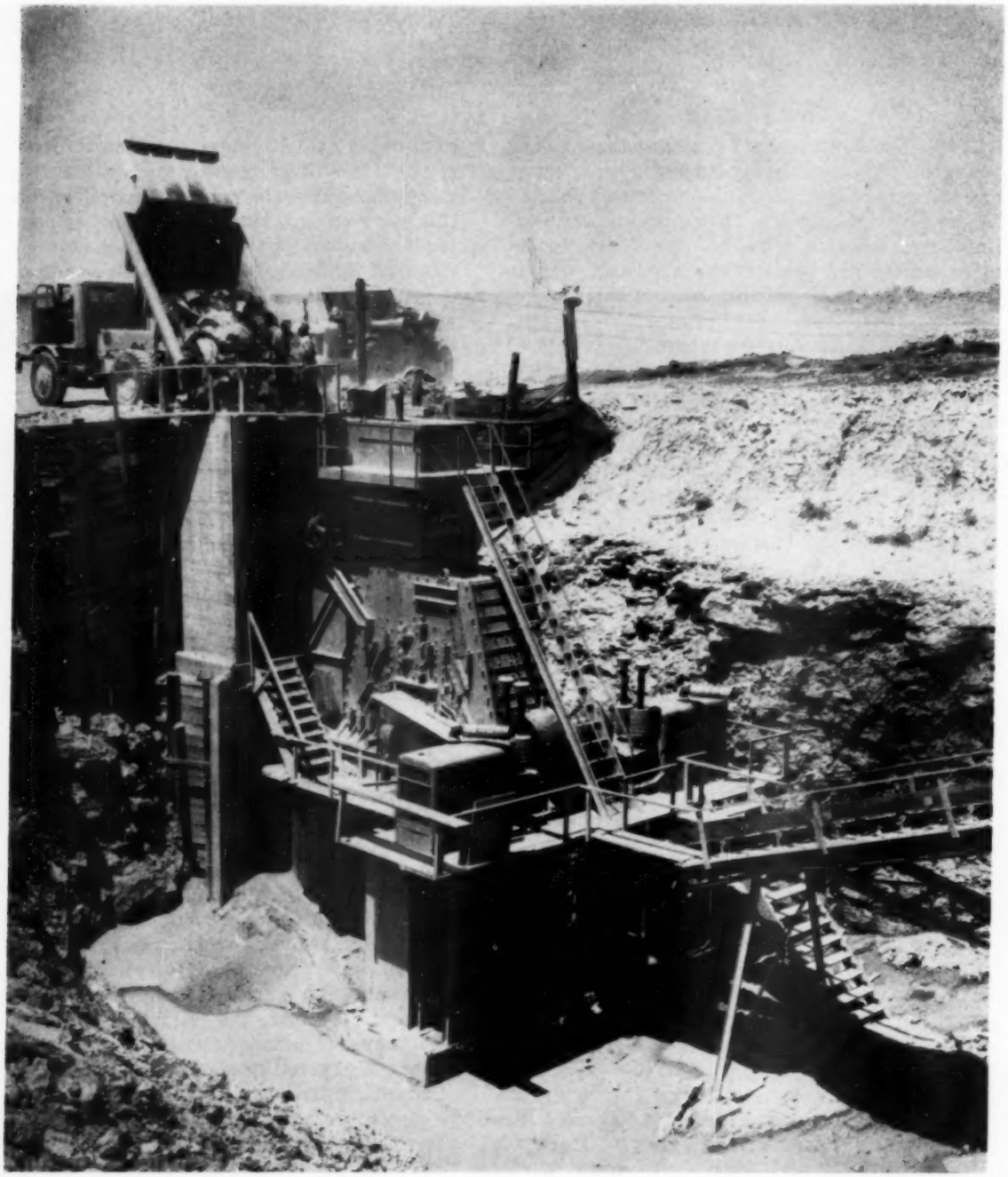
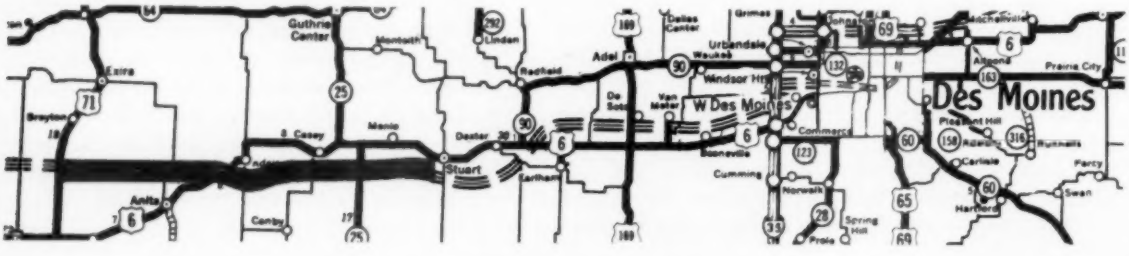


DEEP HOLE IN QUARRY FLOOR hid the big 5360 primary impact breaker. A single big primary meant less secondary blasting, even with wider blasthole spacing. This primary broke enough limestone to make more than a million tons of stabilized roadbase material. The map below shows the huge roadbuilding job Schildberg supplied—33 miles of Interstate 80



E. F. Schildberg followed this formula to win a contract but make a profit: plan well, figure close, bid low

Plan ahead to get big contracts

by Kneeland A. Godfrey, Jr.

CAREFUL ADVANCE PLANNING to produce a million-ton order paid big dividends in the form of a fat contract for E. F. Schildberg Construction Co., Greenfield, Iowa, last spring and summer. The firm was low bidder on a contract which required the supplying of crushed road-base rock.

To illustrate what this amount of material will do, Mr. Schildberg points out that it constituted all the road base for 33 miles of Interstate 80, a four-lane road being built East-West across Iowa from Davenport, through Des Moines, to Omaha, Neb. In just 7½ months, the firm's novel but efficient plant did the job, crushing every bit of the hard limestone down to minus 1 in.

Not only did the planning enable Schildberg to compute what his costs would be, permitting the lowest possible profitable bid, it also gave the firm time to locate the best deposit near the project. The two years of planning by Production Vice President Dennis Schildberg and General Superintendent Jack Long enabled the firm to assemble a very efficient plant. Results: Schildberg's bid was lowest, yet a profit was insured because the efficient setup held costs down.

The big plant put out more than 1,000 tph. of crushed road base between January 1 and August 15. Crews worked 12-hour, one-shift days, six days a week. Many days the plant crushed more than 12,000 tons, reports owner E. F. Schildberg. Basically, the huge operation had a 5360 primary impactor, then two 3645 secondary impactors, then four screen-crush portable plants and, finally, three pugmills to add water to permit maximum compaction on the grade.

Here are some of the cost-cutting features Jack Long and Dennis Schildberg put into their interesting plant: (1) They knew it would have to ship a million tons of stone in only 4½ months, between April and August. But they cut capital spending by starting earlier. Around the first of the year stripping started, as did assembly of the crushing plant. By March 15, they started to build a stockpile that reached 330,000 tons at its biggest.

(2) Flexibility built into the operation insured

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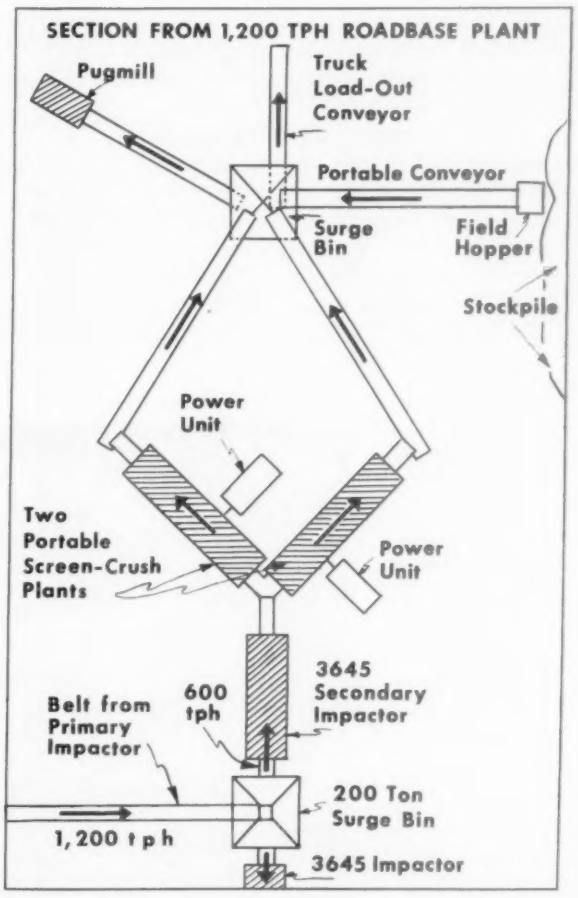

PLAN AHEAD TO GET BIG CONTRACTS

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that once shipping began, no plant breakdowns would halt the delivery trucks. After hauling began April 1, 200 trucks were on the job. Peak periods saw 20,900 tons shipped in one day and 103,000 tons in a single week. The roadbuilding contractors didn't want to have all this equipment sitting idle when the plant was being repaired.

The big stockpile proved one of the answers to insure against this possibility. It was drawn down whenever shipments exceeded production. Too, a surge bin after the primary impactor meant that production continued even should a big chunk of limestone have jammed that crusher. Again, surge bins set in the process flow just ahead of the pugmills could be loaded with portable conveyors directly from stockpile. This use of stockpile and surge bins was a key to economical, nonstop shipments of rock to the job.

(3) One towering primary impactor was chosen over two smaller units, E. F. Schildberg explains, partly because it could take larger chunks of blasted rock. This meant that little secondary blasting was necessary. It also permitted the drill crew to space its blastholes farther apart. (The 3-in. holes were spaced at 15 x 17 ft. on the 20-ft.-high single ledge). This cut drilling and explosive cost.

(4) To minimize operating costs, the 5360 primary impactor was placed down on the quarry floor instead of up beside the plant. This well-planned move cut average haul distance to little more than 300 ft. and eliminated a steep 30-ft. climb for the eight quarry haul trucks.

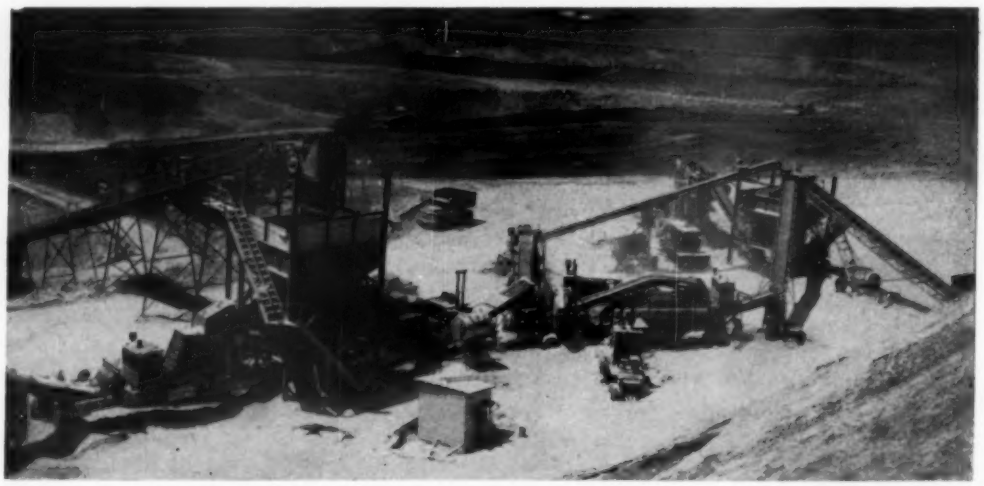
(5) Equipment was leased to save money. Production in 1959, more than 2 million tons, was perhaps double Schildberg's average annual production. This regular production went on without a hitch, in addition to this Interstate contract. Since the usual operations couldn't use all the equipment needed for the big contract, much of it was rented to minimize capital spending.

Here's the plant's equipment setup which proved so efficient in making the crushed road-base product at low cost. First came the stripping crews, removing an average of 30 ft. of overburden from the 19 acres of stone required for the job. Schildberg used five scrapers, three 21-cu. yd. and two 15-cu. yd. units. Four D8 crawlers and two D9s gave a push-loading assist.

Next came the drilling and blasting operation. Two wagon drills pushed 3-in. holes down 20 ft. Because the holes were reasonably dry, low-cost, high-efficiency ammonium nitrate prills could be used as the blasting agent.

Four shovels and eight quarry haul trucks carried the blasted rock to the primary impactor. Two of the shovels were 1½-cu. yd.; two ran with 2½-cu. yd. buckets. Hauling from shovel to impactor was handled efficiently by five rear-dump haulers carrying 18-ton loads, plus three 22-ton rock wagons. Any preference noted between the rock wagons and rear-dump trucks? Schildberg's crews state that the rock wagons really highball on reasonably level going, and have wonderful maneuverability. But the rear dumps pull better on grades, they report.

At the plant itself, the 1,200-tph. primary was carefully placed as deep down in the quarry as possible, a move which minimized uphill hauling



PROOF of plant's flexibility is found in this view from atop the huge stockpile of finished road-base. To the right is half of the secondary portion of the plant—one 3645 secondary breaker, two portable crush-screen plants and pugmill

for the trucks. This excavating job wasn't really too tough, since the quarry had already been open for six seasons, and about a million tons had been withdrawn.

A fast-moving, 42-in. conveyor belt carried the rock next to the first surge bin, holding about 200 tons. From this point the plant was split into two identical units on opposite sides of the bin. The 600 tph. chuted to each side dropped first, to a secondary impactor, then was split again for a short trip to two screen-crush portables. Finally, finished stone made the short run to the pugmills and was fed from there directly into the delivery trucks. With these two similar sections, the plant was sure to continue working, even had one or more crushers or screens dropped out of operation.

After leaving the two 3645 secondary impactors, the stone was split again into four production lines leading to the four screen-crush plants. Two 4 x 12-ft. and two 5 x 14-ft. twin-deck flat screens scalped plus 1-in. stone to the final crushers. Three of the hammermills were 40 in., one was 50 in.

From there, the four production lines were paired to make two lines feeding into two surge bins. Stone sent here dropped to two of the three pugmills, all 8-ft. twin-shaft units. (The third pugmill drew material directly from the big stockpile built up behind the plant.) The pugmills added 8 percent water, taken from a nearby stream.

In building the stockpile, Schildberg used six 16-ton, tandem-axle rear dumps to haul from plant to top of pile. For rehandling from stockpile to the pugmills, two 2½-cu. yd., front-end loaders and two ¾-cu. yd. power shovels did most of the work, loading two portable conveyors. A D8 crawler dozer pushing into a hopper fed the third portable conveyor which, in turn, lead to a pugmill.

To avoid confusion, each of the three contractors using Schildberg's crushed road-base rock operated from a separate pugmill and truck scale assigned to him. With 200 trucks operating, this plan simplified the dispatching job and made each contractor, not Schildberg, responsible for smooth delivery schedules between production plant and job site.

Other staff members of E. F. Schildberg Construction Co. in charge of the big quarry job, besides those mentioned above, were John Schildberg, sales vice president; Frank Maynes and Kenneth Ulrich, base plant superintendents, and John Waalk, quarry foreman. END

MAJOR EQUIPMENT REFERENCE

In the Quarry	
Scrapers, (3) 21 yd., (2) 15 yd.	Caterpillar Tractor Co.
Pushers, (4) D8s, (2) D9s	Caterpillar Tractor Co.
Power shovels, (2) 1½ yd., (2) 2½ yd.	Northwest Engineering Co.
Quarry hauling, (5) 18-ton model 91s rear dumps	Euclid Div. GMC
(3) 22-ton S12 rock wagons	Euclid Div. GMC
Wagon drills (2)	Gardner-Denver Co.
Air compressors, (1) 600-cfm., (1) 500-cfm.	Gardner-Denver Co.
Explosives, AN prills	DuPont Co.
At the Plant	
Primary impactor, 5360	Iowa Mfg. Co.
Secondary impactors, (2) 3645	Iowa Mfg. Co.
Screening-crushing plants (4)	Iowa Mfg. Co.
Pugmills, (3) 8-ft. twin-shaft	Iowa Mfg. Co.
Rehandling Equipment	
Front-end loaders (2), 2½ yd.	Mixermobile Mfgrs.
Shovels (2) ¾ yd. model LS85	Link-Belt Speeder Corp.
Dozer, Model D8	Caterpillar Tractor Co.
Trucks (6) 16-ton tandem rear-dumps	Chevrolet Motor Div.

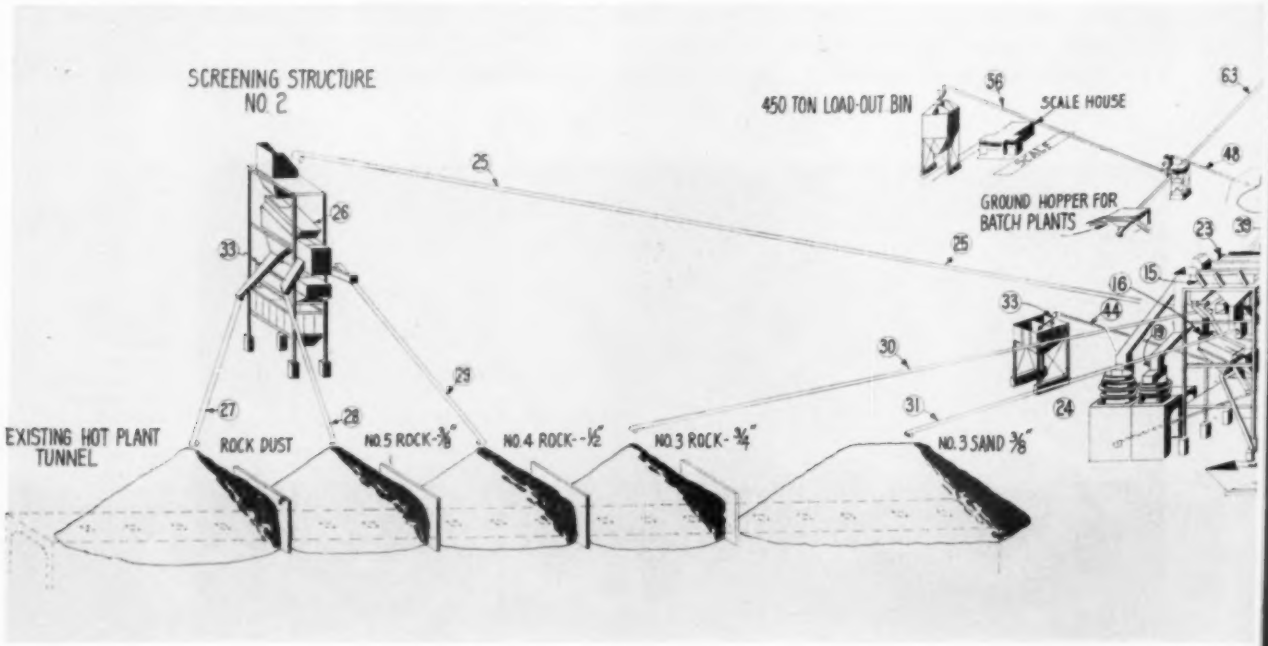
PUGMILL for getting correct moisture level in road-base is fed from the big stockpile by two ¾-cu. yd. shovels. Notice stratified material in the pile, pushed there in even lifts by a dozer

PACESETTING PLANT STRESSES AUTOMATION, HMS

by Ralph S. Torgerson

THERE'S NOTHING SMALL about the way Southern Pacific Milling Co. does things, but this leading California producer outdid even itself in designing a new sand and gravel, ready-mix and hot-mix plant at El Rio. The ultramodern installation is a pacesetter in imaginative, efficient use of equipment to turn out large tonnages of top-quality material. It has a capacity of 600 tph. to the surge pile and about 400 tph. through screening, washing and crushing operations. Two outstanding features are extensive use of electronic controls and a heavy-media flotation system to upgrade aggregates.

The recently opened El Rio plant is a consolidation of two older plants—at El Rio and Montalvo. It also is the headquarters for the company's 11 plants that produce paving materials, and for the Construction Division that handles paving and grading contracts. As the hub of an energetic enterprise, it houses two-way radio equipment that directs a fleet of 100 dump and 55 ready-mix trucks, as well as a testing laboratory, and a central service shop where much of its major repair work is done.



For its El Rio, Calif., sand and gravel, ready-mix and hot-mix plant, Southern Pacific Milling Co. overlooked nothing in improved design and equipment

The heavy-media system at Southern Pacific differs from the usual practice where the HM plant operates as part of the normal production line. Here, the large stockpile of washed aggregates is used as a surge pile, and the HM plant is operated only when required to meet peak highway demands. The sink-float system, pioneered by Southern Pacific Milling Co. in the West at its Sisquoc plant, is used at El Rio.

For most purposes, the plant's raw materials output—taken from a nearby stream deposit that is 65 percent sand and 35 percent rock—presents no problem. However, tougher concrete highway specifications dictated the need to remove a large percentage of unsound and reactive elements. Until now, the company supplied specification material in this area by importing it from a considerable distance. The new setup permits use of local materials, with savings to both company and its customers.

The last word in electronic controls governs the movements of all equipment at the El Rio plant. An operator stationed at a remote-control console in the top deck of the sand and gravel plant keeps a check on the machinery used in screening, crushing and heavy-media flotation. There is a central control console at the concrete batching plant for the reclaiming belt conveyor below the stockpiles and the feeders and gates. A duplicate of this panel, at the ground level, may be operated by another man when the batch plant operator is too busy with mixer trucks.

Another electrical control console in the scale house controls bin levels and loading out of concrete aggregates going to other company-owned batch plants, independent haulers, etc. The controls operate conveyors and electric air-operated gates drawing off aggregates from various stock-

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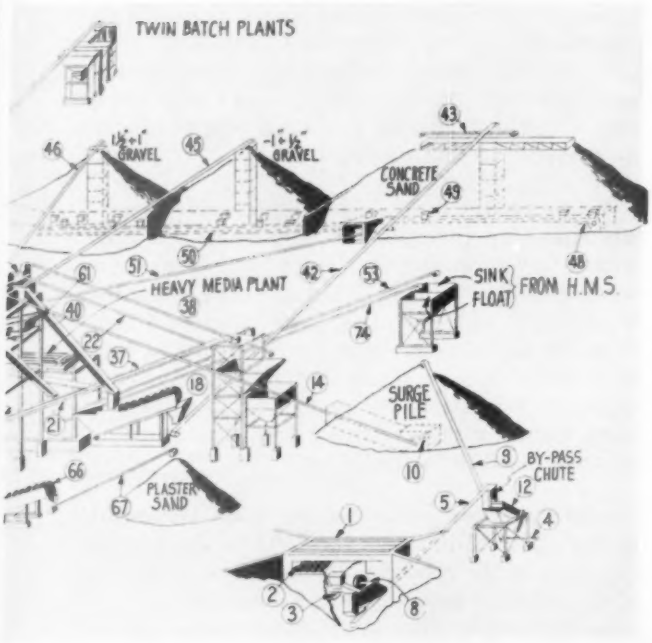


KEY TO EL RIO PLANT of Southern Pacific Milling Co.

1—Pit-run trap (drive-over)
2—Grizzly over trap, 10-in. I beams, 1½ ft. O.C.
3—Vibrating feeder with grizzly
4—36-in. picking belt
5—30-in. conveyor to scalping screen
8—36 x 24-in. jaw crusher
9—30-in. stacker conveyor to surge pile
10—Vibrating feeder, 30 x 72 in. (in surge tunnel)
12—Sand scalper 4 x 12-ft. single-deck (dry)
14—30-in. conveyor, to main screening tower
15—5 x 20-ft. screen (dry)
16—4 x 12-ft. double-deck screen (wet)
18—48-in. sand classifier (concrete sand)
19—3-ft. std. cone crusher
21—24-in. conveyor from cone crushers
22—24-in. conveyor, crushed rock to screen #23
23—4 x 14-ft. double-deck screen (dry)
24—4-ft. short-head crusher
25—24-in. conveyor to screening structure #2
26—4 x 12-ft. double-deck screen
27—24-in. conveyor, rock dust to hot plant storage
28—24-in. conveyor, #5 rock to hot plant storage
29—24-in. conveyor, #4 rock to hot plant storage
30—18-in. conveyor, #3 rock to hot plant storage
31—18-in. conveyor, unwashed coarse sand to hot plant storage
33—3½ x 10-ft. flat deck screen
37—Unwashed gravel to transfer tower
38—Unwashed gravel to screen #39
39—4 x 10-ft. double-deck screen (wet)
40—4 x 10-ft. double-deck screen (wet)
42—24-in. conveyor, washed concrete sand to storage
43—24-in. shuttle conveyor over sand storage
44—18-in. conveyor, ¼ x ½-in. gravel to bin
45—18-in. conveyor, ½ x 1-in. gravel to storage
46—18-in. conveyor, 1 x 1½-in. gravel to storage
48—24-in. reclaim conveyor in storage tunnel
49—Feeders from storage to conveyor # 48
50—18-in. conveyor, in tunnel, feed to HMS plant
51—18-in. conveyor, feed to HMS plant
53—18-in. conveyor (finished material to bin) from HMS
56—24-in. conveyor to load-out bins
61—4 x 14-ft. single-deck screen
63—24-in. conveyor to twin batch plants
66—30-in. sand classifier (plaster sand)
67—18-in. conveyor (plaster sand to stock pile)
74—18-in. conveyor (float material from HMS to bin)

PACESETTING PLANT STRESSES AUTOMATION, HMS

continued from page 99

piles when the 450-ton, compartmented steel bin is loaded.

"Stop," "Go," "Back-up" and "Office" electric signal lights at the front end of the 70-ft. scale are operated by foot pedals by the dispatcher in loading trucks from the overhead storage. With this arrangement, a truck is loaded to its maximum capacity in a minimum time. The 60-ft. scale on the opposite side of the specially designed elevated scale house is controlled by a "Stop" and "Go" signal that insures orderly movement of trucks hauling from the adjacent 6,000-lb. hot-mix plant.

To get an idea of the scope of the El Rio operation, follow the flow of material from the deposit to the load-out bins. Various steps in its passage through the plant are identified by numerals that can be located on the accompanying flow sheet. Scooped from the deposit by a 3½-cu. yd. dragline and loaded into 38-ton bottom-dump haulage units, raw materials are taken to the plant.

The haulage units move up a ramp to dump into a 70-ton hopper over a combination vibrating grizzly and pan feeder (3). Oversize goes to a 24 x 36-in jaw crusher (8) with the product joining the throughs on a 30-in. belt conveyor (5) inclining up to a 4 x 12-ft., single-deck scalping screen (12) with 1-in. openings. The oversize is placed on a short flat belt (4) where mud balls are picked off by hand before joining the throughs on the 30-in. stacker belt conveyor (9) to the surge pile. Below the surge pile in a reclaiming tunnel is a 30 x 72-in. vibrating feeder (10) which feeds material to a belt conveyor (14) to the main washing and screening tower.

Here the materials are fed to a 5 x 20-ft., double-deck scalping screen (15) which screens out rock from excess sand. Oversize from the top deck is split to either a 3-ft. standard (19) or a 4-ft. short-head (24) cone crusher. Crushed products move up a belt conveyor (21) to a transfer tower from which a conveyor (22) returns them to a 4 x 14-ft., double-deck screen (23) in the main screening tower. Top-deck oversize on this screen is returned to the 4-ft., short-head cone crusher. Throughs, a minus ½-in., are carried by belt conveyor (25) to the dry side of the plant, or screening tower No. 2, where a 4 x 12-ft., double-deck screen (26) sizes the materials into dust, a No. 5, or ⅜ in., and a No. 4, or ½-in. Conveyor belts place the finished materials in open stockpiles that are located over a reclaiming belt conveyor in a concrete tunnel leading to the hot-mix asphalt plant.

Throughs from the top deck of the 5 x 20-ft. scalping screen (15) go to a split deck. The upper 15 ft. takes off a minus ⅜-in. material that can be diverted to belt conveyor (31) to the hot-plant stockpile or may be chuted to a conveyor (37) to the transfer tower for return to the 4 x 10-ft., double-deck wet screen (39).

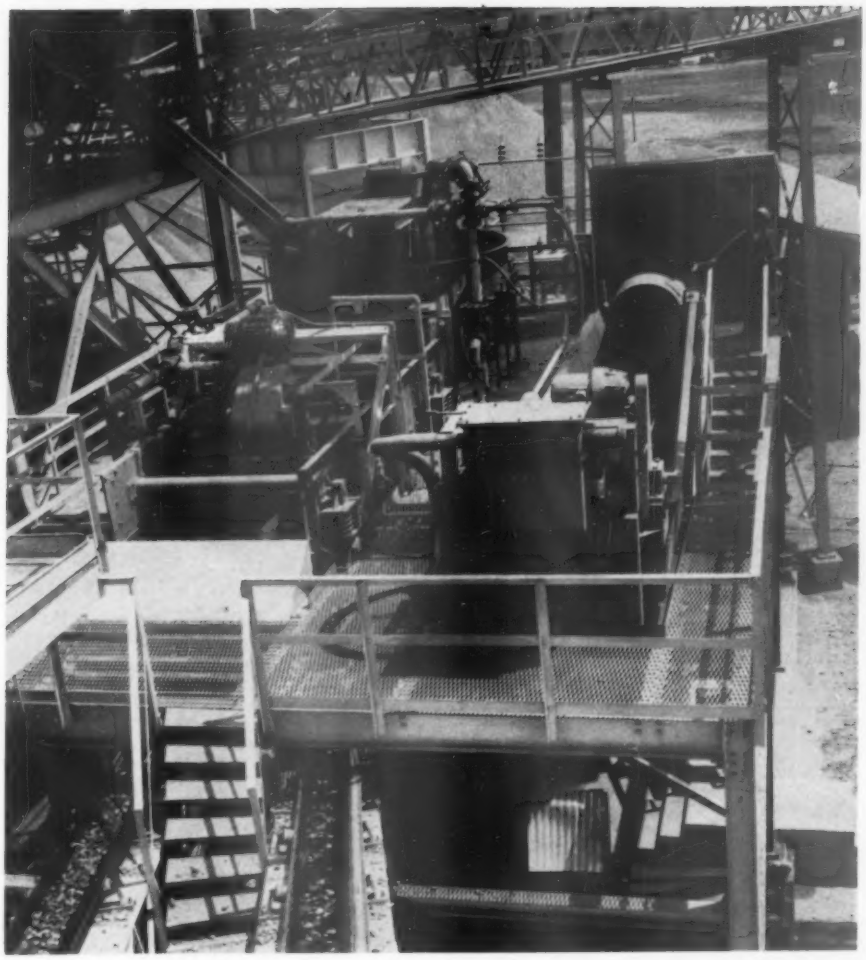
The last 5-ft. section of the 5 x 20-ft. screen goes to a split screen box and can be diverted to a conveyor (21) for a dry end product or to (37) for washed concrete aggregates. Alternatively, this material can go to the 4 x 12-ft., double-deck wet screen (16). Oversize on the 3/16-in. top deck of this screen is rock material that is returned to the system. There is very little of the 3/16 x No. 8 material from the lower deck, but it is sent to a 4-ft. shorthead or to a washed gravel system. Through-screen sands pass to classifier (66) for the production of plaster sand.

The top-deck product of screen (39) is the minus 1½ to plus 1-in. gravel stockpiled by conveyor (46). Material passing the top deck of wet screen (39) and retained on the second deck goes to another 4 x 10-ft., double-deck screen (40) with a ⅜-in.-mesh top deck. Oversize from this deck goes by stockpiling conveyor (45) to the minus 1-in. to No. 4 gravel stockpile. Material from the second deck moves by conveyor (44) to a single-deck screen (33) over a bin with the products, No. 4 and No. 5 gravel, split into two compartments. Minus ¼-in. material from the bottom deck of screen (39) goes to a 48-in. classifier for the production of concrete sand which is conveyed (42) to a shuttle-belt conveyor over the stockpile.

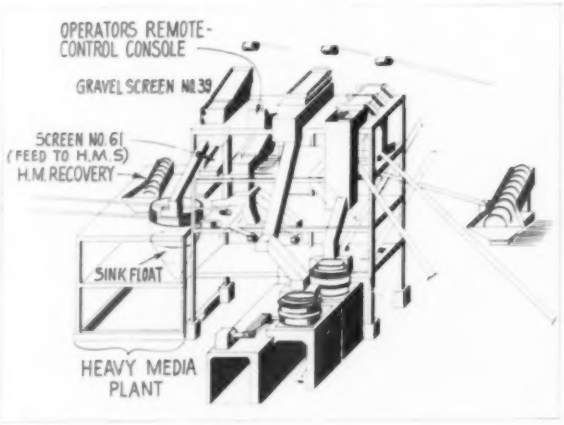
All overflow from classifiers and excess water from screens is discharged to a large steel tank from which it is pumped in a steel pipe to an old raw material pit and wasted.

The tunnel conveyor below the concrete aggregate stockpiles contains two reclaiming belt conveyors. One 24-in. conveyor (48) inclines up to a swivel distributor which either diverts aggregates to conveyor (63) for the twin concrete batch plants or transfers to conveyor (56) to the 450-ton load-out bins at the scale house. The ground hopper is reached by ramp to permit trucks to dump materials not reclaimed from inventory as may be needed for a special job.

Aggregates are reclaimed for HMS treatment by the other 18-in. conveyor (50) in the tunnel, operating in the opposite direction. The stockpiles of washed aggregates serve as a surge pile for this phase of the operation. *Please turn to page 102*



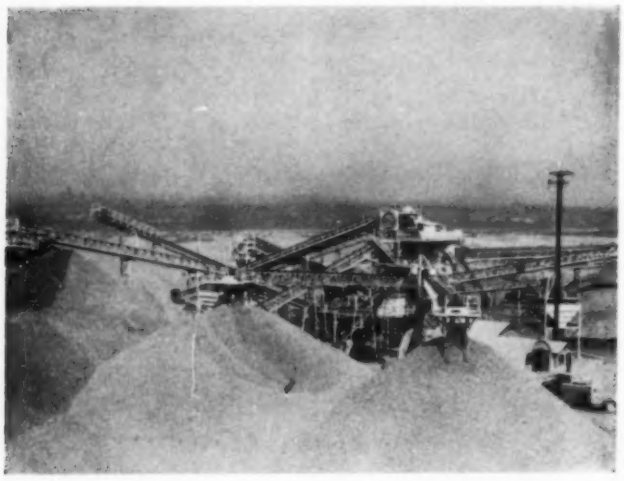
THE whole heavy media system is arranged in a compact group. The separatory cone at the rear discharges both float and sink directly to the launder and rinsing screen. At the right is a magnetic separator and screw classifier which prepares the valuable minerals to be recycled to the vessel



CLOSE-UP of main processing tower with Mobil-Mill HMS equipment

HEART OF THE HEAVY MEDIA SYSTEM AT EL RIO is the 10 ft. diam. vessel. Float is discharged at the right, while sink comes out at lower center

IT TAKES ONLY A FEW MINUTES for this big tractor shovel to load aggregate into a truck and get it on its way



A MAZE OF CONVEYORS AT EL RIO obscures the efficiency of the high-capacity operation

RIGHT: These 38 ton bottom-dump haulers keep the 3½-cu. yd. shovel hustling in the stream-bed deposit to keep ahead of them

PACESETTING PLANT STRESSES AUTOMATION, HMS

continued from page 101

Aggregates from the stockpile are carried by conveyor (51) to a 4 x 14-ft., single-deck screen (61) for further washing and screening before passing into the 10-ft. diam. cone where the basic separation is made. This screen has a dual purpose. The first half of the deck has sprays which remove fines which might change the density of the heavy media. The second half removes excess water to send aggregates to the cone with a uniform moisture content. The media plant uses these components in its liquid medium: 50-percent magnetite with sg. of 4.98, and 50-percent ferrosilicon which has sg. of 7.00. Sufficient of these heavy materials are suspended in water to give a heavy media with specific gravity about 2.55.

An airlift at the bottom supplies agitation, with the sink blown upward through the center of the cone to the launder on a 6 x 16-ft., single-deck rinsing screen. The float raked off the top of the heavy media vessel goes to the other section of the screen. The screen does three vital functions. The first section removes excess media from the launder and returns this valuable material to the media circuit. Then sprays flush the media coating from the aggregate. This slurry is pumped to the magnetic separator to recover the magnetic minerals. Last section of the screen takes out all excess water before dropping it to conveyors to loading bins.

The last major component of the HMS plant is the magnetic separator and screw classifier. The magnetic separator is a revolving drum that takes the media with wash water from the second section of the screen. Magnets inside this drum remove the magnetite and ferrosilicon from the water and release these into the tank of the spiral classifier. The spiral action of the classifier then removes the solids from the surplus water, and these solids can then be introduced back into the heavy media circuit as needed. The spiral screw has a hydraulic lifting device to raise or lower the screw in the tank which controls the amount of solids put back into the media circuit.

Technically trained personnel run constant control check tests on the company's products, and a well equipped laboratory is maintained at the El Rio headquarters. A central maintenance shop at this location performs much of the maintenance work on equipment operating out of this location as well as major repairs on equipment stationed at the outlying branches.

A very close check is kept on specific gravity of media in the cone. Carefully taken samples are tested every half hour for specific gravity and recorded on a sheet to show that no important deviation has occurred. Media loss is about ½ lb. per ton of feed.

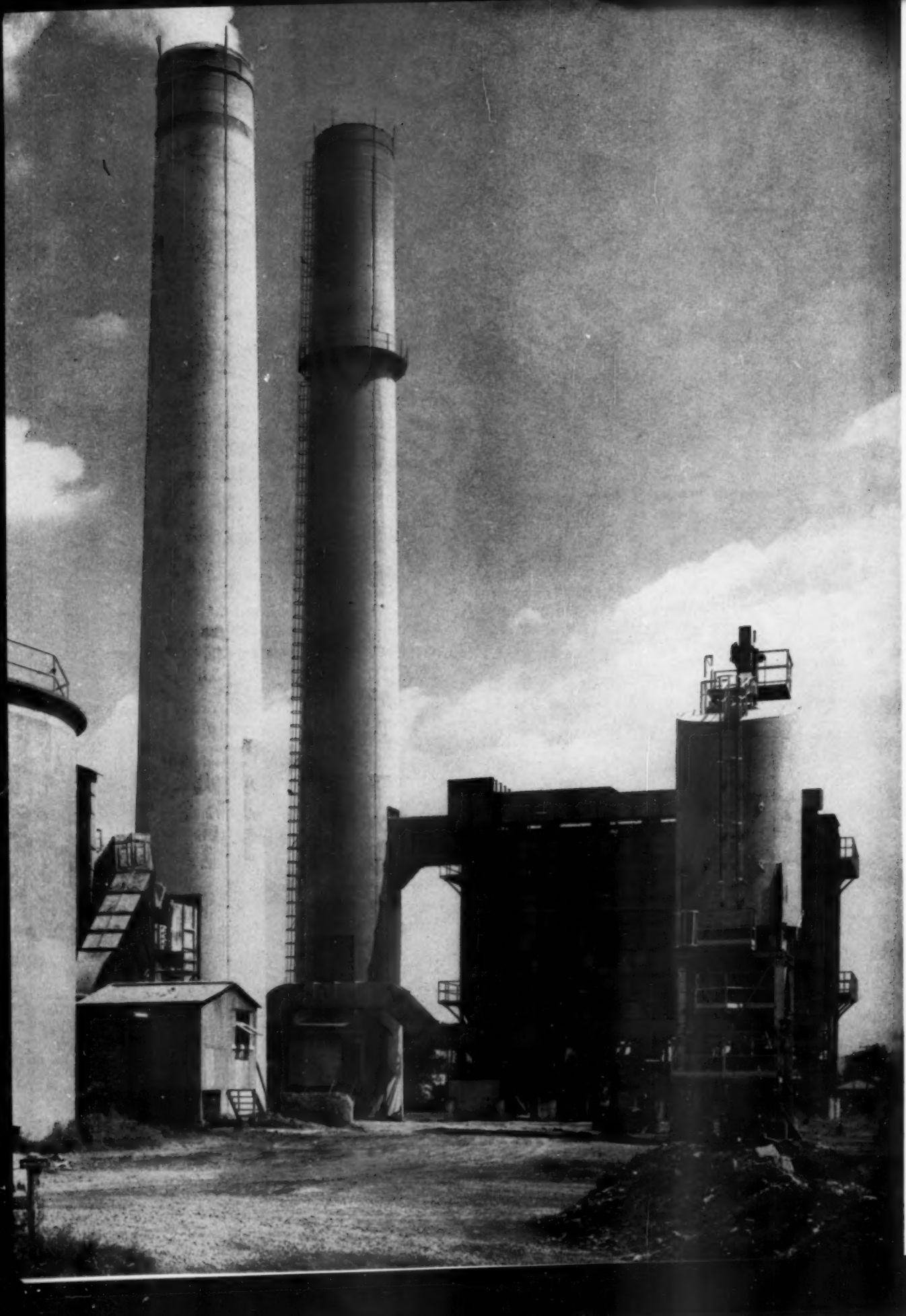
A view of the plant isn't complete until you have noted the two-way radio equipment, located in the scale house, that permits communication with many company-owned trucks and automobiles. About 100 dump-truck units are operated by Southern Pacific, but independent haulers represent 75 percent of the tonnage, with 25 percent company-owned. A total of 55 ready-mix trucks serve all the plants. These units are shifted from plant to plant by radio as needed.

Power for operation of the plant is taken from the utility company's line at 16,000 v. and stepped down by transformers to 440 v. for operation of all motors. A recording wattmeter in the power control house records on a chart the power load, calibrated to show in tonnage the material being processed in the sand and gravel plant.

The modern, air-conditioned administration building at El Rio has very attractive offices for its executives, a lounge for women employes with refrigerator and electric oven, a conference room and library, and the latest electronic tabulating and bookkeeping machines in its centralized accounting department. **END**

MAJOR EQUIPMENT REFERENCE

3½-cu. yd. Model 95 dragline	Northwest Engineering Co.
38-ton haulage units (3)	Euclid Div., General Motors Corp.
Combination vibrating grizzly and pan feeder	Syntron Co.
30 x 72-in. vibrating feeder	Syntron Co.
24 x 36-in. jaw crusher	Kue-Ken Co.
4 x 12-ft., single-deck scalping screen (2)	Hewitt-Robins, Inc.
5 x 20-ft., double-deck screen, HI-G screen	Hewitt-Robins, Inc.
4 x 10-ft., double-deck screen	Hewitt-Robins, Inc.
Belt conveyors	Hewitt-Robins, Inc.
Conveyor belting	Thermoid Div., H. K. Porter Co.
4 x 14-ft., double-deck screen	Thermoid Div., H. K. Porter Co.
4 x 12-ft., double-deck screen	Thermoid Div., H. K. Porter Co.
3-ft., standard cone crusher	Nordberg Mfg. Co.
4-ft. short-head cone crusher	Nordberg Mfg. Co.
Heavy media system (Mobil-Mill)	Western Machinery Co.
30-in. classifier (plaster sand)	Western Machinery Co.
48-in. classifier (concrete sand)	Western Machinery Co.
Heavy-media reclaiming classifier	Western Machinery Co.
Heavy-media flotation plant	Western Machinery Co.
Twin concrete batch plants	Noble Mfg. Co.
6,000-lb. hot-mix asphalt plant	Madsen Iron Works, Inc.
Two-way radio equipment	Motorola, Inc.
Two-way radio equipment	General Electric Co.
Electric motors operating conveyors and screens	General Electric Co.
Switchgear and power control panel	Westinghouse Electric Corp.; Mullenback Div., Electric Machinery Co.
4-cu. yd. tractor shovel	The Yale & Towne Mfg. Co.
Truck scales	Howe Scale Co.
Accounting machines	International Business Machines Corp.



Two Lehigh Valley cement plants lick air pollution problem

Glass bags, sonic cleaning achieve dramatic results

THERE'S NO CAUSE FOR COMPLAINT issuing from the No. 1 kiln stack at Dragon Cement Co.'s Northampton, Pa., plant. Veteran cement officials viewing it recently did a "double take," because there was no visible indication that the kiln was in full operation and all effluent was concentrated into that stack. Such efficiency—virtually all dust and smoke are removed—merited their curiosity and comment.

The answer is that Dragon has adopted a new method to halt air pollution which eventually will corral dust from all four of its kilns at Northampton. Glass-bag filters are the core of the modular design system which employs sound waves to clean the bags automatically. The latter, patented as "Sonoclean," vibrates the bags in an undulating motion, without flexing. Besides being easy on the filter cloth, it has a low maintenance feature in eliminating extensive shaking mechanism with supporting members, bearings and motors.

Dragon, a division of American-Marietta Co., is one of two leading Lehigh Valley cement producers to use the new filtration system to cut down on dust in that well-populated area. Allentown Portland Cement Co. is the other producer. At its Evansville, Pa., plant, Allentown uses these glass-cloth bags to filter exhaust gas from a suspension preheater for its No. 5 kiln. These applications in the cement industry extend the use of the dust-collection system originally developed for the copper and zinc industries.

Dragon chose this particular solution to its air-pollution problem after several of its representatives visited a number of pilot installations. They saw a pilot installation of the glass-bag filter system at work at the Evansville plant of Allentown Portland Cement. Here, they thought, was a sound design principle that offered an effective means of collecting hot kiln dust.

Dragon's introduction to the glass-bag filter system led to discussions between Dragon and manufacturer's engineers, plus a careful development of design features and specific application requirements. Dragon then placed its order. The No. 1 kiln at its Northampton plant got the first compartmentalized glass-bag filter in the industry.

Meanwhile, Allentown's management, in continuous observation of the pilot operations at Evansville, decided to install a full-scale commercial model. After more than three months' operation, Evansville reported the installation "eminently successful."

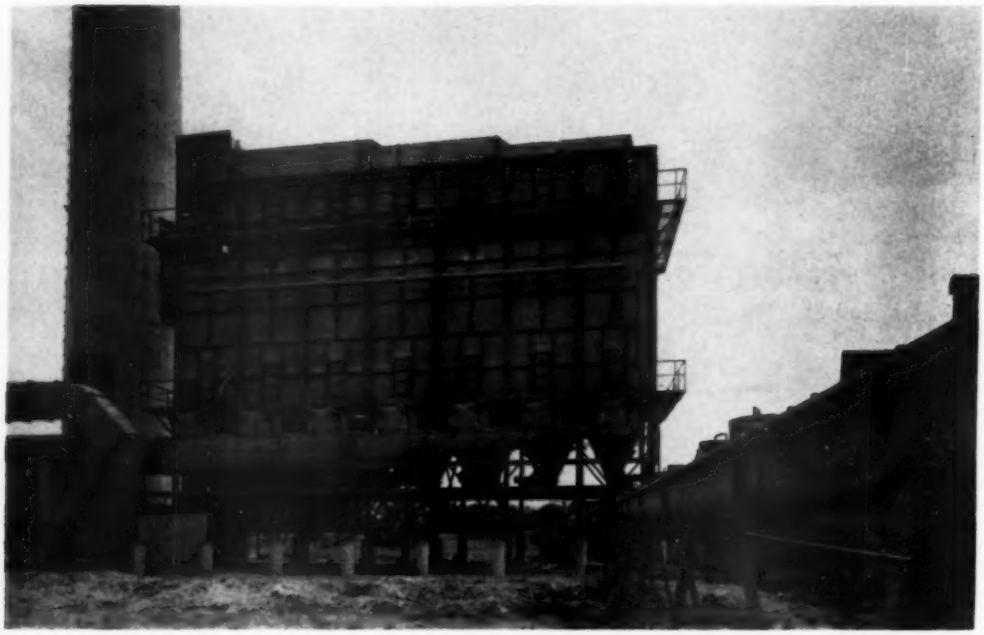
Dragon's approval of the glass-bag filter came in the form of an order for three more systems, one for each of the Northampton plant's remaining kilns.

As set up at the Dragon Cement plant, the system has seven compartments, with 56 glass bags each. The bags, 11½ in. diam. x 25 ft. long, are arranged in pairs, 14 bags deep, on each side of a central aisle. Air-to-cloth ratio is 1.47 cfm. per sq. ft. during normal operation and 1.71 during cleaning. Gas volume is 50,000 cfm. at 550 deg. F.

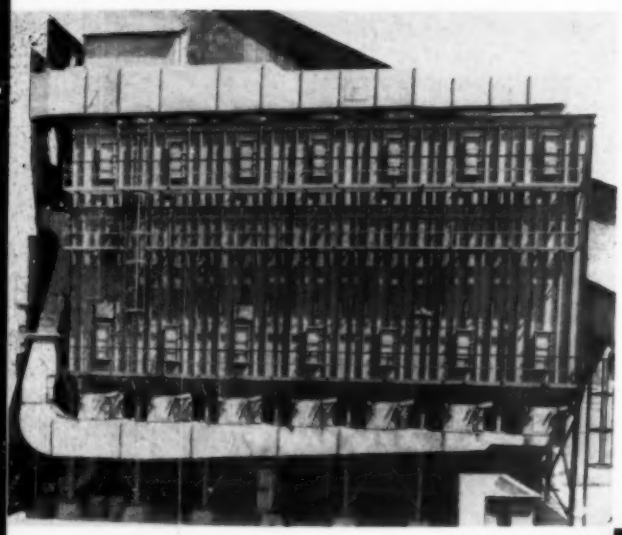
The system, with a total of 392 glass bags, is

Please turn page

CLEAN STACK AT DRAGON CEMENT offers dramatic proof of glass-bag filter effectiveness. All effluent from No. 1 kiln is concentrated into stack at right, but filter removes all visible dust. Three duplicate units are now on order to clean gas from three remaining kilns

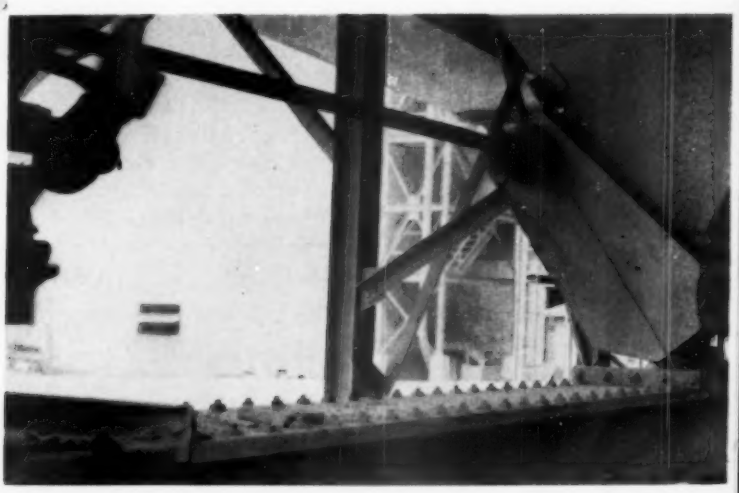


ABOVE: Dust removal at Dragon is accomplished with integral trough hopper screw conveyors which move collected dust to a central conveyor leading to disposal facilities



LEFT: Proximity of Allentown's glass-bag filter to preheater is shown here. Combination of raw mix and kiln clinker from preheater imposes abnormally heavy dust load. About 92 percent of filter's catch is minus five micron particles

BELOW: Dust removal from filter hoppers at Allentown Portland Cement is accomplished by rotary feeders which discharge material into screw conveyor leading back to kiln



TWO LEHIGH VALLEY CEMENT PLANTS LICK AIR POLLUTION PROBLEM

continued from page 105

tied in with a cyclone which receives kiln exhaust and extracts the low alkali content, returning it to the kiln. Gas and remaining dust is blown into the filter through an exhaust duct. Thermostatically controlled inlet valves introduce auxiliary air into the dust to reduce temperature to 600 deg. at the filter intake. This temperature is reduced to 550 deg. by the time the gas reaches the bags. These are maximum advisable temperatures for satisfactory performance and bag life.

Each of Dragon's seven compartments has a trough hopper equipped with an integral screw conveyor which empties collected material into a common screw conveyor for disposal.

The glass-bag filter system at Evansville, though similar, has interesting variations. Here, it handles the exhaust gas of a Fuller-Humboldt suspension preheater for the No. 5 kiln. This is a 7-compartment filter employing a total of 336 bags.

Incoming raw mix enters at the top of the preheater and passes through four cyclone stages in series through which the exit gas of the kiln is drawn. This preheats the raw mix and acts as a heat exchanger, cooling the kiln exhaust gas to below 600 deg. F. Gas is blown through the filter, cleaned and exhausted to the stack. Collected particles are discharged through rotary feeders beneath each of seven filter hoppers into a screw conveyor leading back to the kiln.

Capacity of this system is 42,000 cfm., and collection rate is approximately 1 tph. Collection efficiency of 99.96 percent is reported on the system, with particle size approximately 100 percent minus 10 microns; 91.9 percent is minus 5 microns. (Particle size at Dragon also closely approaches the minus 5 micron figure.)

As mentioned before, these installations incorporate Sonoclean, a method of dust removal by sonics combined with depressurization by reversed air flow. The method is covered by a patent controlled by the manufacturer of the glass-bag filter system.

A program timer regulates the bag-cleaning operation, maintaining an automatic filtering-cleaning cycle. Here's how it works:

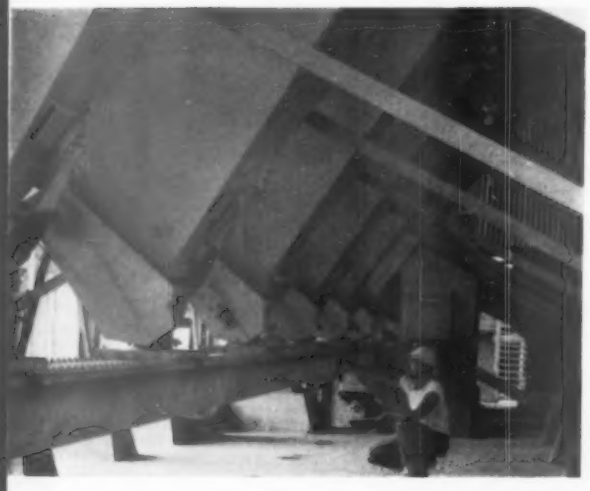
Each compartment is on stream for 35 minutes and off one minute for cleaning. Since there are seven compartments, a compartment is being cleaned every five minutes. According to the program, air valves shut each compartment off from the rest of the filter at the inlet below the bags. The compartment is depressurized with a small reverse-air fan, and the bags relax. Sonoclean is actuated and sonic energy cleans the bags. Air valves open and the compartment goes back on stream, after only a one-minute shutdown. Incoming gas, meanwhile, is accommodated by the other six compartments.

Bag life is expected to average at least a year with this type of bag cleaning, plus special glass cloth treatment. Some filter units have had a bag life of more than two years under severe operating conditions.

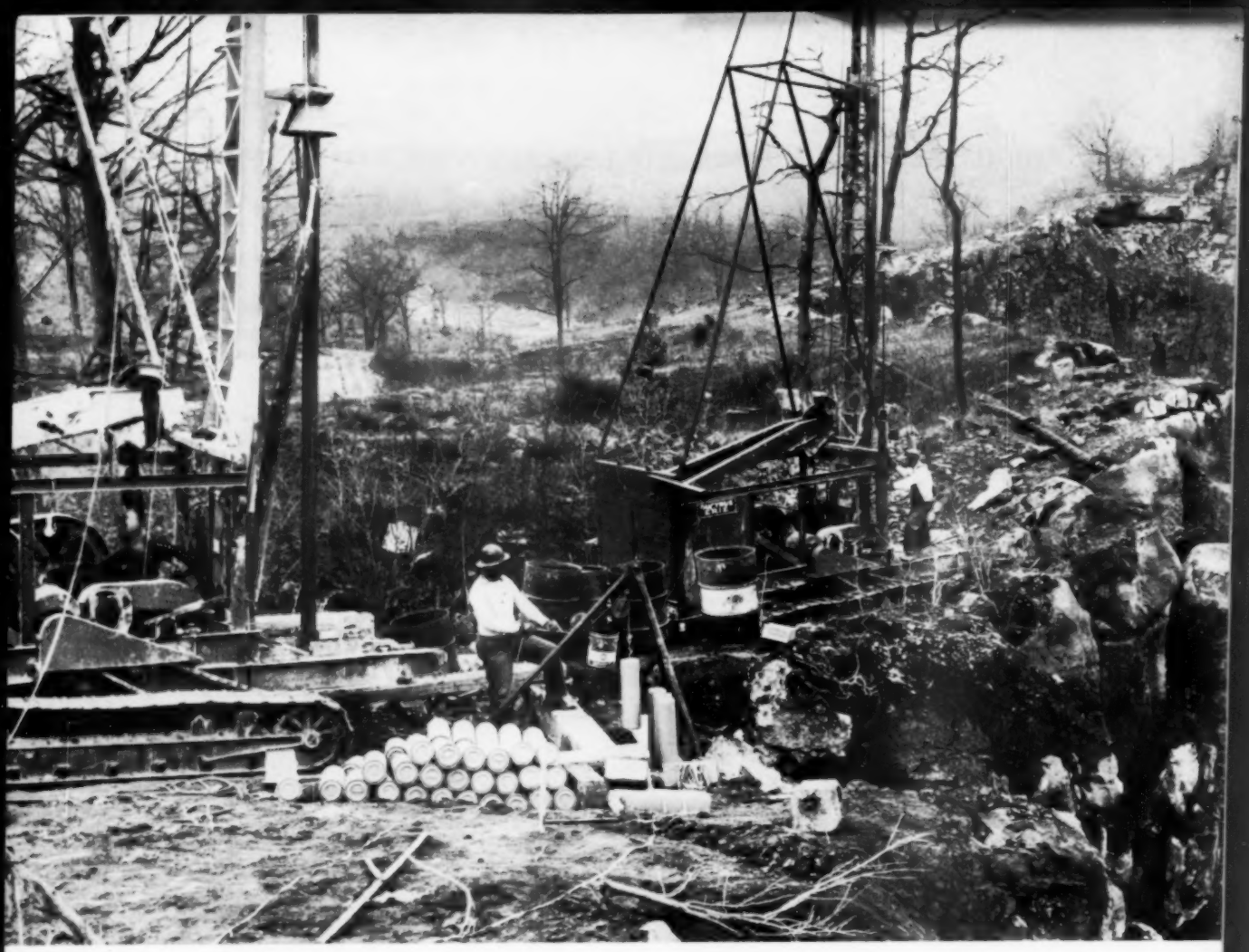
Modular design of the system makes any capacity possible. Any number of compartments may be combined into a unitized system. Such systems are easily expandable and can be adapted to varying types of processing arrangements.

The units have another virtue—simplified inspection and maintenance. Interior insulation permits an individual compartment to be shut off and cooled so that a man can enter and inspect it, or replace bags when necessary. Shut-down of one compartment does not interfere with the operation of the others.

Advantages are being realized by these first two cement companies to adopt this new tool against air pollution. But in industrial Lehigh Valley the advantages are multiplied by the number of people in the teeming community. They are the real beneficiaries of any method to bring about clean skies above kiln stacks. **END**



EQUIPMENT REFERENCE: *Glass-bag filters with Sonoclean are manufactured by Dracco Div., Fuller Corp.*



November 17, 1958. Driller (center foreground) loading first hole of a blast at Acme Limestone Company's quarry in Fort Spring, W. Va.

"Preloading with Du Pont Nitramex® helped us cut costs while our wage scale was going up," reports Acme Limestone Company

"We have had a 45% increase in our wage scale, yet we have been able to reduce our unit costs per ton for loading and shooting," says Mr. A. W. McThenia, president and general manager of Acme Limestone Company.

This is brought about by the drillers loading each hole with non-cap-sensitive "Nitramex" 2H as soon as it is drilled. Holes cannot plug with loose stones or heavy clay from their quarry's cavernous seams. Result: Acme gets full value for all drilling time.

They never have to bring a drill back over holes to open them up. Holes may be loaded six months or longer before firing—a procedure which would be practically impossible with dynamite or prills.

Better fragmentation • "With 'Nitramex' we get

May 21, 1959. Acme Limestone Company quarry face 40 holes and 6 months later.

May 21, 1959. After the shot—288,000 tons of well broken limestone.

maximum density, with the result that our fragmentation is far beyond our former expectations," Mr. McThenia continues. "We have increased our tons per hour through our primary crusher, which in turn materially reduces our costs per ton all down the line."

The Acme people speak with authority. They have been using Du Pont Nitramon® and Nitramex® for the last ten years and have had four years' experience with the preloading method.

It's safer • Du Pont "Nitramex" 2H is inherently safer than conventional dynamites. It is not cap sensitive and cannot be detonated prematurely by the most severe abuse that would normally be met in quarry operations.

Resists water, handles easily • "Nitramex" 2H is hermetically sealed in metal containers, so it has infinite water resistance. And you get no headache from handling.

Your Du Pont representative can tell you more about this blasting agent and the dollar-saving, time-saving, preloading method. Contact him or write to E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, 6444 Nemours Building, Wilmington 98, Delaware.

Chief Engineer, Bill Ruby, supervises loading.

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If we look closely at the number and kinds of accidents occurring in the different kinds of quarries, we can develop insight into their causes and be more effective in our efforts to reduce them

There is safety in numbers

ACCIDENT STATISTICS furnish us with vastly more than exercise in arithmetic. Read correctly, they can be a warning and a guide. Take, for example, the reported accident figures in the quarrying segment of the rock products industry. If we look closely at the number and kinds of accidents occuring in the different kinds of quarries, we can develop insight into their causes and be more effective in our efforts to reduce them.

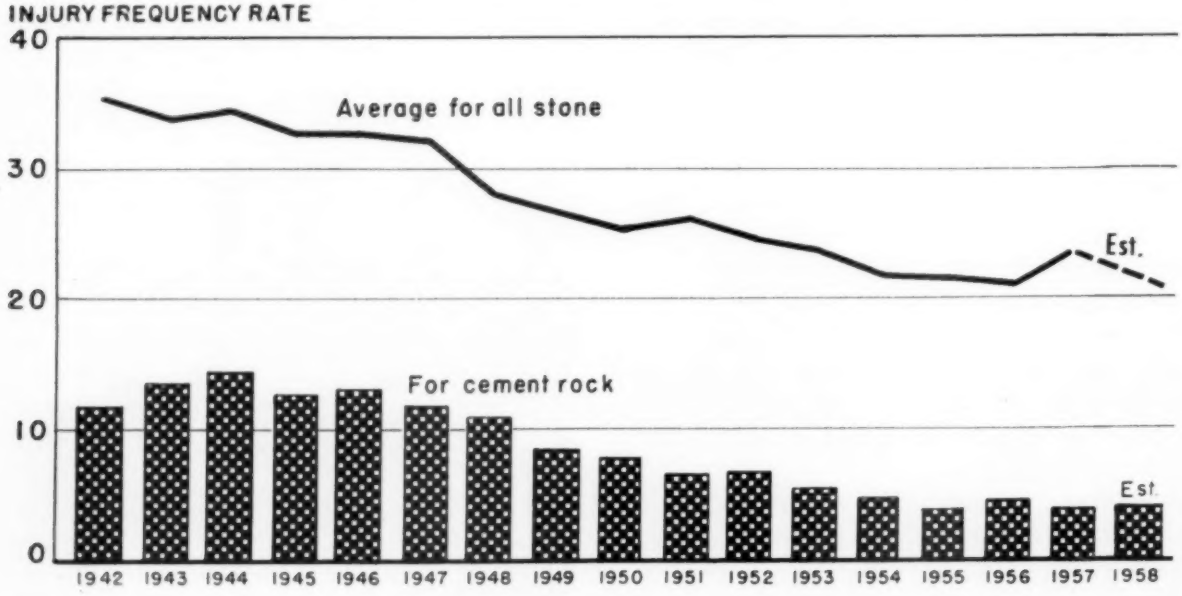
This article is a review and summary of the paper presented by J. C. Machisak to the Cement, Quarry and Mineral Aggregates Section meeting at the National Safety Congress in Chicago, October 19, 1959. Mr. Machisak is Chief, Branch of Accident Analysis, Division of Safety, Bureau of Mines, U. S. Department of the Interior, Washington, D.C.

At a first look, the accident record of the whole quarrying industry wasn't too bad according to Table I. In fact, total injuries have reduced steadily over a period of 15 years from a high of 6,461 in 1942 to an estimate of 3,749 in 1958. During this period employment fluctuated widely, but the 1958 record was compiled with only five percent fewer workers than in 1942. The accident-frequency rate declined steadily during these 15 years.

But it should be obvious that there is no direct relationship between number of accidents and number of employes. For example, 1945 was a year

Please turn to page 112

FIGURE 1—Injury frequency rate of cement rock compared with the average rate of the whole stone industry, 1942-58



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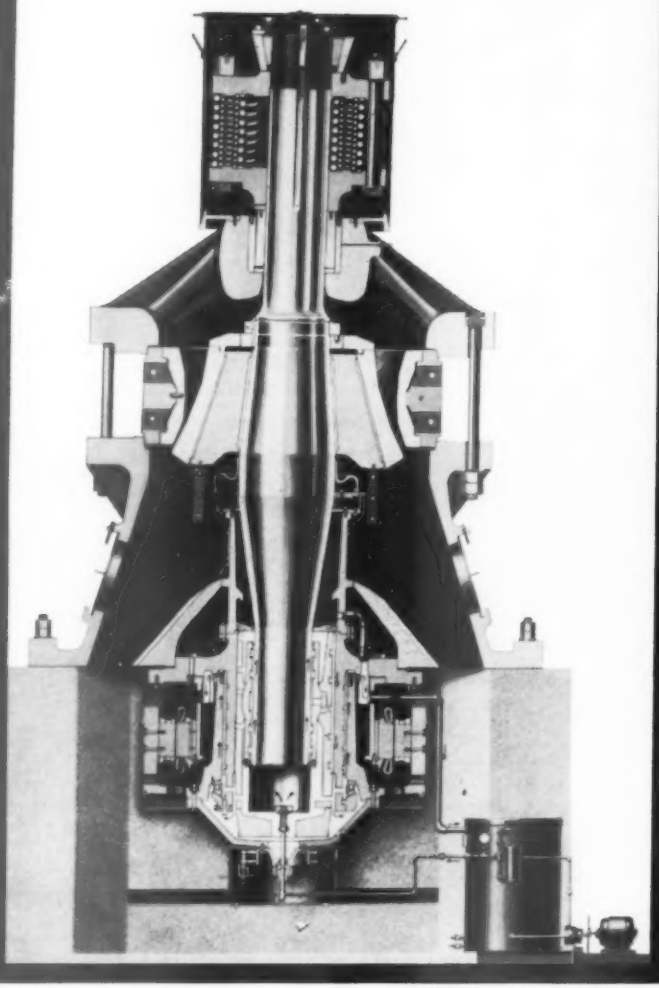

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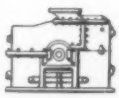

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THERE IS SAFETY IN NUMBERS

continued from page 110

of very low employment, yet the gross number of accidents was almost the same as in 1957, the year of maximum employment.

The year of the greatest number of injuries, 1942 with 6,461, was a year of very high employment. The lowest absolute number of accidents was tabulated in 1956 when the number working was only slightly higher than 1942.

Let's look at the accident record for each kind of quarry and see how it compares with the average of which it is a part. If the frequency is the same as that of the industry as a whole, then it is making par for the course. But if its frequency is much different, we have something tangible to work with.

The sources for our safety statistics are quarries producing cement rock, limestone for lime making, as well as limestone, granite and trap rock for aggregates. In addition, we tallied figures for the quarries which make dimension stone—sandstone, slate and marble.

The dimension-stone industry provides an example of above-average accident rates. During the past five years, dimension-stone quarries have averaged about 10.6 percent of total employment in quarries; but in the same period, they have contributed nearly 21 percent of the accidents. It would be interesting to go further into these figures, for the record seems to be getting worse over the past 15 years.

Cement and the high-calcium limestone quarries of lime producers have achieved outstandingly good safety records, as shown in Table II, column 2. Cement-rock quarries have always been sub-

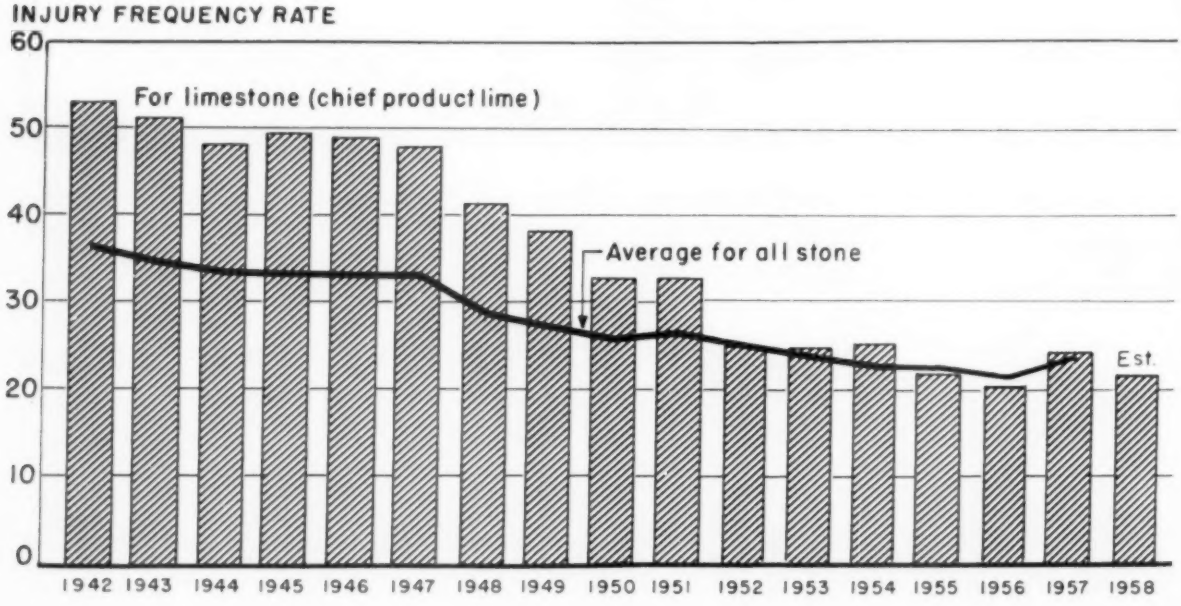
Please turn to page 114

Table I—Employes in the Nation's stone industry, total fatal and nonfatal injuries 1942-1958, and frequency rate

Year	Total Employment	Total Injuries	Frequency Rate
1942	84,270	6,461	35.7
1943	69,877	5,279	34.0
1944	58,476	4,510	34.9
1945	58,180	4,174	32.8
1946	70,265	5,192	32.8
1947	75,245	5,579	32.4
1948	77,344	5,069	28.3
1949	82,209	4,892	26.8
1950	85,730	4,816	25.4
1951	84,802	5,002	26.2
1952	81,879	4,577	24.5
1953	83,641	4,493	23.7
1954	78,910	3,868	22.0
1955[1]	82,935	3,873	22.0
1956[1]	85,033	3,808	21.3
1957[1]	89,318	4,277	23.2
1958[2]	80,500	3,749	22.2

[1]Includes office workers; [2]Preliminary data (excluding office workers)

FIGURE 2—Injury frequency rate of limestone (chief product lime) compared with the average rate of the whole stone industry, 1942-58



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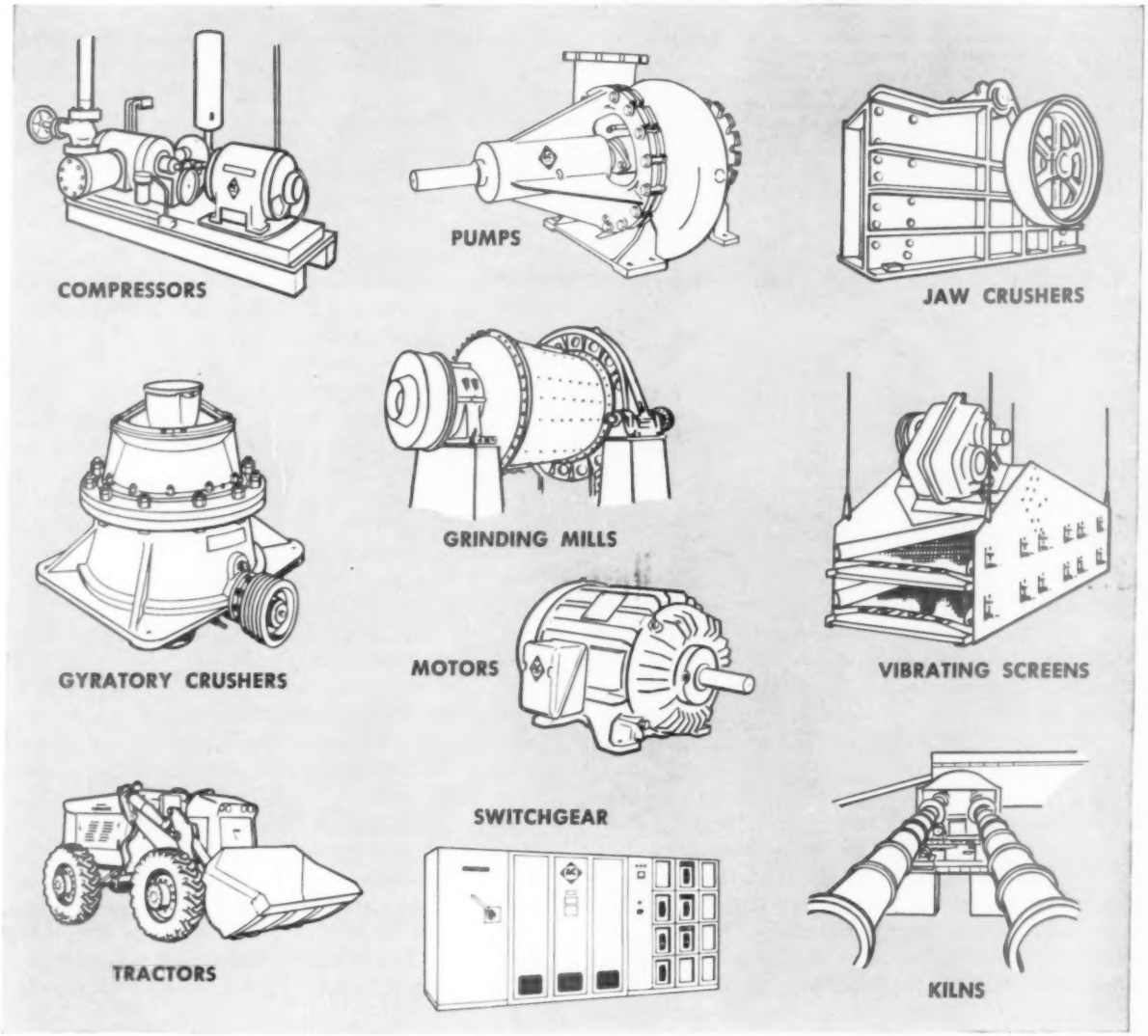

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THERE IS SAFETY IN NUMBERS

continued from page 112

Table II—Injury frequency rate of cement rock and lime rock producers compared with the "all stone" rate 1942-1958

Year	Injury frequency rates[1] All stone	Cement Rock [3]	Limestone (chief product lime)
1942	35.7	11.7	52.8
1943	34.0	13.3	50.9
1944	34.9	14.2	47.6
1945	32.8	12.7	49.4
1946	32.8	13.2	49.1
1947	32.4	12.0	47.4
1948	28.3	11.0	41.1
1949	26.8	8.4	37.8
1950	25.4	7.7	32.6
1951	26.2	6.6	32.3
1952	24.5	6.7	24.4
1953	23.7	5.3	24.4
1954	22.0	4.6	24.8
1955	22.0	4.0	21.4
1956	21.3	4.5	20.4
1957	23.2	3.9	24.0
1958 [2]	22.2	4.0	21.7

[1]All rates rounded to one place beyond decimal; [2]Preliminary estimate; [3]Includes all stone used in the manufacture of cement

stantially below the frequency of the stone industry—and their record has been getting better all the time. High frequency was in 1944, a war year, and has dropped steadily to a record low of 3.9 points in 1957. Fig. 1 shows clearly and graphically the spectacular safety record of this segment of the industry.

Quarries which produce limestone for the lime producers also have an exceptional record, but in a different way. They have come from behind to run abreast of the industry. Historically, these quarries have had accident-frequency records substantially higher than the average. Table II (column 3) reports a frequency of 52.8 points in 1942, compared with the industry average of 35.7.

But in 1952, there was a dramatic change. In that year the limestone industry injury frequency dropped to equal the industry average. To prove that this was no coincidence, this industry's record has consistently held close to the average for the whole. Fig. 2 shows what has happened in this kind of quarry over the years, indicating a continuous and vigorous approach to the problem of safe working conditions.

With this kind of success behind them, lime producers should have no difficulty breaking away from the average and attempting to achieve the same low-accident frequency as the cement-rock segment of the stone-quarrying industry.

The excellent injury frequency record of the cement-rock producers has a profound influence on the safety statistics for the whole quarrying industry. In a way, their good record is unfortunate for industry statistics, since it makes the figures look better than they are. It is doubly unfortunate, if the safety record as a whole (including cement-rock) makes any rock products producer complacent, if his record is close to the average.

We have made up the charts on Fig. 3 to show what the accident-frequency rate would look like if the record of the cement quarries were omitted. It is obvious from this chart that the frequency rate would be 10 to a dozen points higher each year—at least 50 percent higher—without the cement rock statistics.

The cement-rock segment of the industry holds the average down; we do not have far to look to see what is keeping the average up. Tables III and IV show that virtually every kind of quarry is operating with an injury frequency well above the average for the industry, and almost astronomical-

Please turn to page 116

FIGURE 3—Average injury frequency rate for the stone industries shown with and without the cement rock subindustry, 1953-58

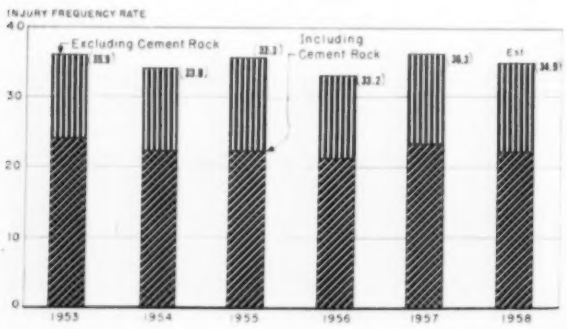
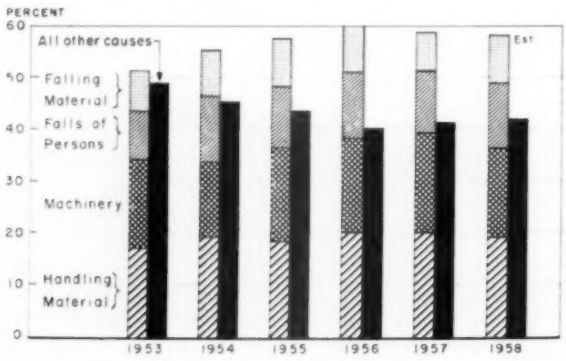
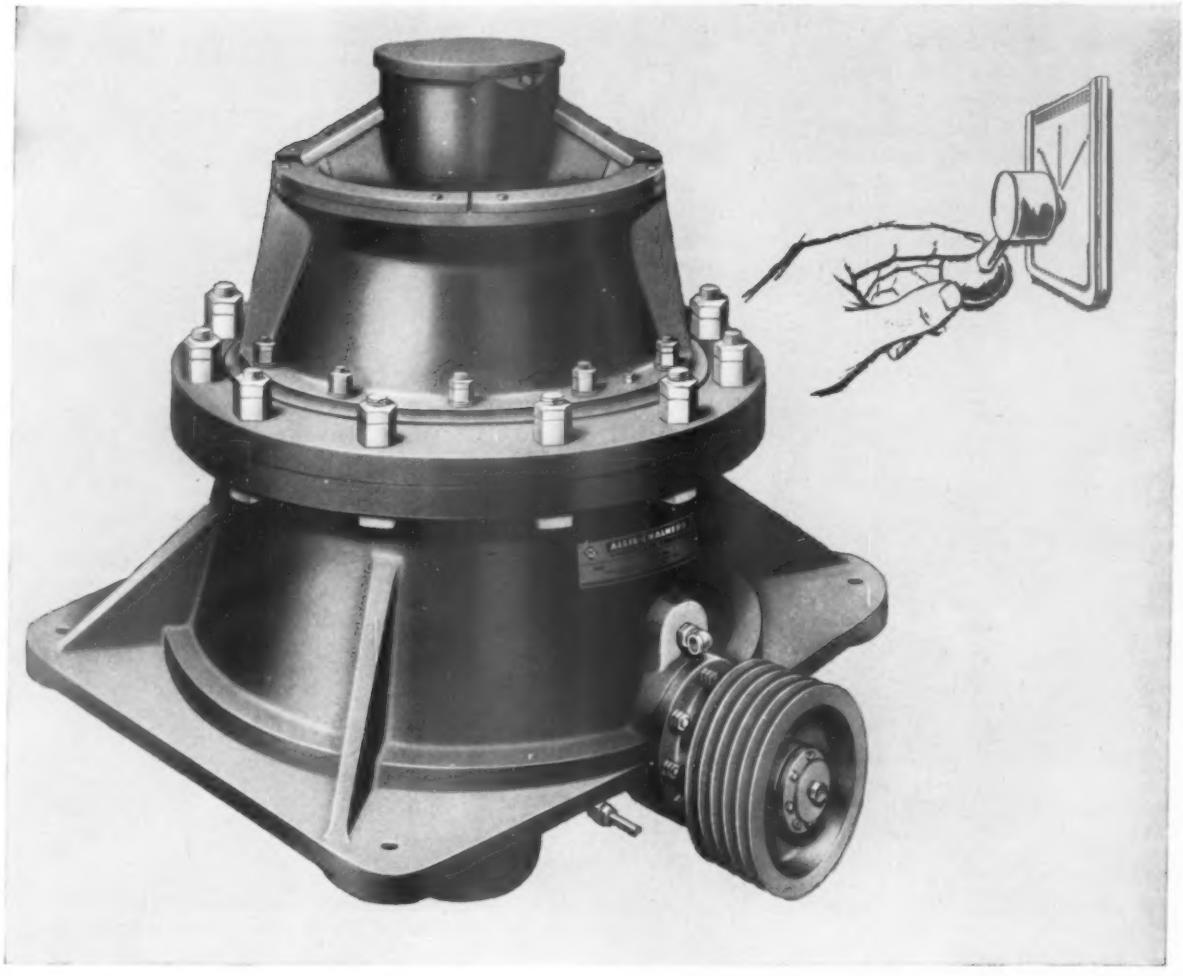


FIGURE 4—Percentage distribution of four major causes of injury in the nation's stone industries compared with all other causes, 1953-58



ALLIS-CHALMERS



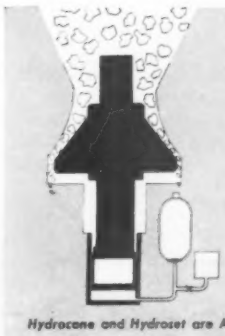
Get any crusher setting at the flip of a switch

1-man, 1-minute product control

Adjustment to product size . . . compensation for wear . . . emergency unloading . . . all of these operations can be done by one man in just one minute with Allis-Chalmers revolutionary *Hydrocone* crusher.

Compare the speed and simplicity of *Hydroset* control with the time-consuming inconvenience of any other method of changing crusher settings — in any other gyratory-type crusher. You'll discover that the *Hydrocone* crusher can actually add hours of production time to your day . . . give you increased tonnage and greater profits by eliminating excessive and costly downtime.

Get all the facts about the *Hydrocone* crusher with *Hydroset* control. See your A-C representative or write **Allis-Chalmers,** Industrial Equipment Division, Milwaukee 1, Wisconsin. A-1240



Hydraulic jack supports cone; crusher setting is controlled by the amount of oil in the jack. A flip of a control switch, conveniently located, positions the cone at any setting.

Hydrocone and Hydroset are Allis-Chalmers trademarks.

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THERE IS SAFETY IN NUMBERS

continued from page 114

ly higher than the record of cement-rock quarries. Obviously, the producers in these areas have a lot to do to improve their safety records.

It is true that many segments have made substantial improvements in their records. Trap rock has dropped from an injury frequency of close to 60 points during the early 1940's to the area of 38 to 43 points in the last few years. But these figures are still 16 to 20 points higher than the average. Limestone (other than lime producers) has made some improvement, dropping from around 45 to about 35. But this kind of improvement indicates an ineffective accident-prevention effort.

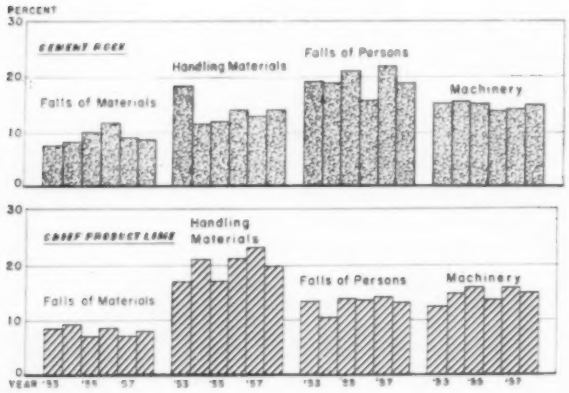

FIGURE 5—Percentage distribution of the four major causes of injury at cement rock and lime producers' quarries, 1953-58

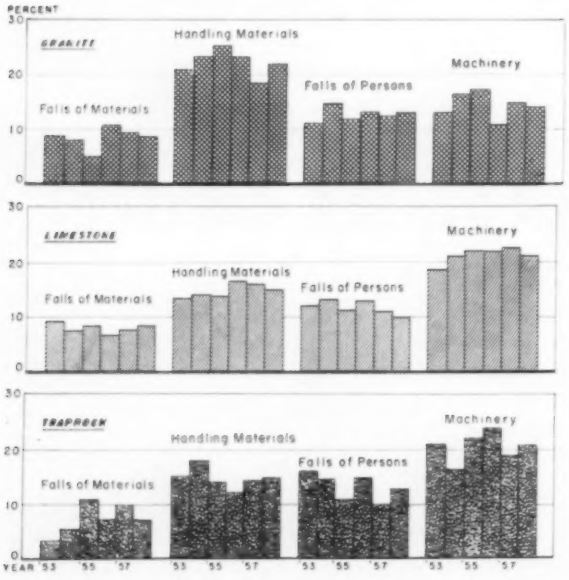

FIGURE 6—Percentage distribution of the four major causes of injury at granite, limestone and trap rock quarries, 1953-58

Table III—Injury frequency rate of granite, limestone and trap rock producers compared with the "all stone" rate 1942-1958

Year	Injury frequency rates[1]			
	All stone	Granite	Limestone	Trap Rock
1942	35.7	43.5	49.6	60.3
1943	34.0	42.5	43.6	59.9
1944	34.9	43.7	43.0	59.4
1945	32.7	46.8	39.9	47.2
1946	32.8	45.6	45.5	43.7
1947	32.4	54.6	44.0	52.0
1948	28.3	47.8	37.9	51.5
1949	26.8	40.7	37.2	44.2
1950	25.4	38.6	35.1	50.4
1951	26.2	40.8	37.8	52.4
1952	24.5	42.5	35.3	42.0
1953	23.7	41.0	36.8	38.6
1954	22.0	35.4	33.7	43.0
1955	22.0	40.8	34.8	38.0
1956	21.3	41.2	32.8	41.3
1957	23.2	43.2	35.6	53.1
1958[2]	22.2	45.3	34.7	42.6

[1]All rates rounded to one place beyond decimal; [2]Preliminary estimate

Sometimes it is difficult for me to understand why this should be so. The limestone is the same material which cement and lime producers quarry—often in the same formation in the same vicinity. Production problems and operating conditions are often identical. Perhaps the discipline and the organized vigilance in the larger, more impersonal organization offsets the individual, personal concern for the worker's safety in the smaller producer. Or, perhaps, the small quarry owner is more easily satisfied with nominal improvements in his safety record.

I could say much the same things about the other types of quarrying on these two tables. Marble and granite producers have the same mediocre safety records. Slate producers have wide swings in injuries, but well above the average.

Now, let's look at the kinds of accidents that take place in these industries. Perhaps these will give us clues how the rates can be reduced substantially. For example, we note that four types of accidents account for nearly 60 percent of injuries, according to Fig. IV. This chart shows the totals of all kinds of accidents in all the types of quarrying I have been discussing. It is interesting to note that "all other" causes of injury have been declining until they now represent only about 40 percent of all causes. So it will probably be profitable to examine the details of the four major types of injuries.

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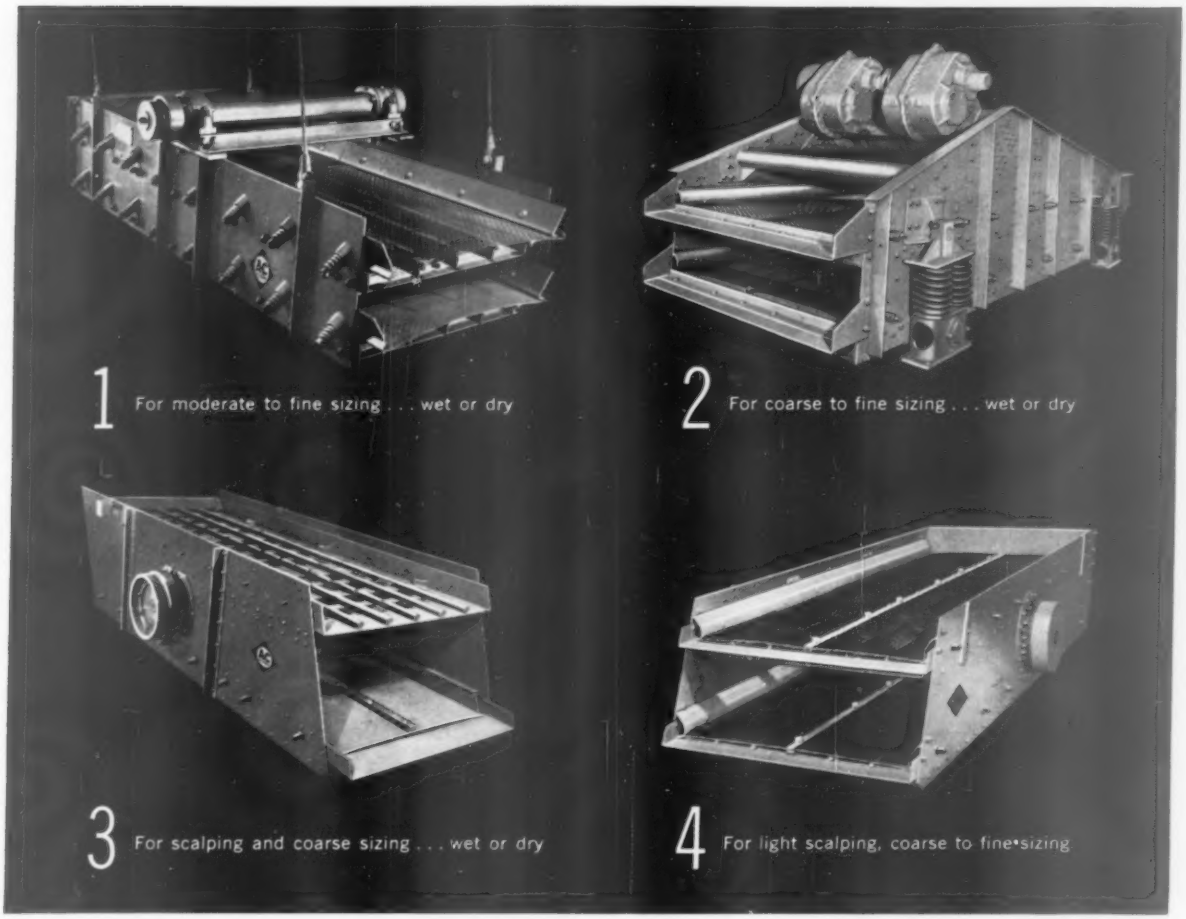
ALLIS-CHALMERS


1 For moderate to fine sizing . . . wet or dry
2 For coarse to fine sizing . . . wet or dry
3 For scalping and coarse sizing . . . wet or dry
4 For light scalping, coarse to fine sizing

Pick a screen to fit your job

. . . be it scalping, sizing, rinsing, washing, or heavy media recovery

Large or small capacity — wet or dry crushed stone, sand or gravel — whatever your application there's an A-C screen for the job. Building the industry's most complete line of horizontal and inclined screens, Allis-Chalmers gives unbiased recommendations — suggesting to you the screen that will do your job at the lowest possible cost consistent with quality.

Built for a beating: There's no skimping on quality at A-C. For example, the frames of Allis-Chalmers screens are carefully machined and *stress relieved* for years of tough usage.

Easy to choose: A helpful screen selection guide has been prepared to help you pick the right model screen for your process. *Contact your Allis-Chalmers representative or write for Bulletin 25B6280. Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada write Canadian Allis-Chalmers, Ltd., Box 37, Montreal, Quebec.*

1 **For moderate to fine sizing** — wet or dry. AVS *Aero-Vibe* inclined screen: Available with wire cloth or perforated plate surfaces. Maximum aperture — 1½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 5 by 10 feet.

2 **For coarse to fine sizing** — wet or dry, rinsing, or media recovery. *Low-Head* horizontal screen: Saves headroom. Wire cloth or perforated plate. Apertures to 2½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

3 **For scalping and coarse sizing** — wet or dry. XH *Ripl-Flo* inclined screen: Wire cloth, perforated plate, rod or stepped grizzly-bar surfaces. Apertures to 10 inches. 1, 2 or 3 decks. Sizes 4 by 8 to 8 by 14 feet.

4 **For light scalping, coarse to fine sizing** — wet or dry, and for rinsing. SH *Ripl-Flo* inclined screen: Wire cloth or perforated plate. Apertures to 5 inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

Aero-Vibe, Low-Head and Ripl-Flo are Allis-Chalmers trademarks.

A-1215

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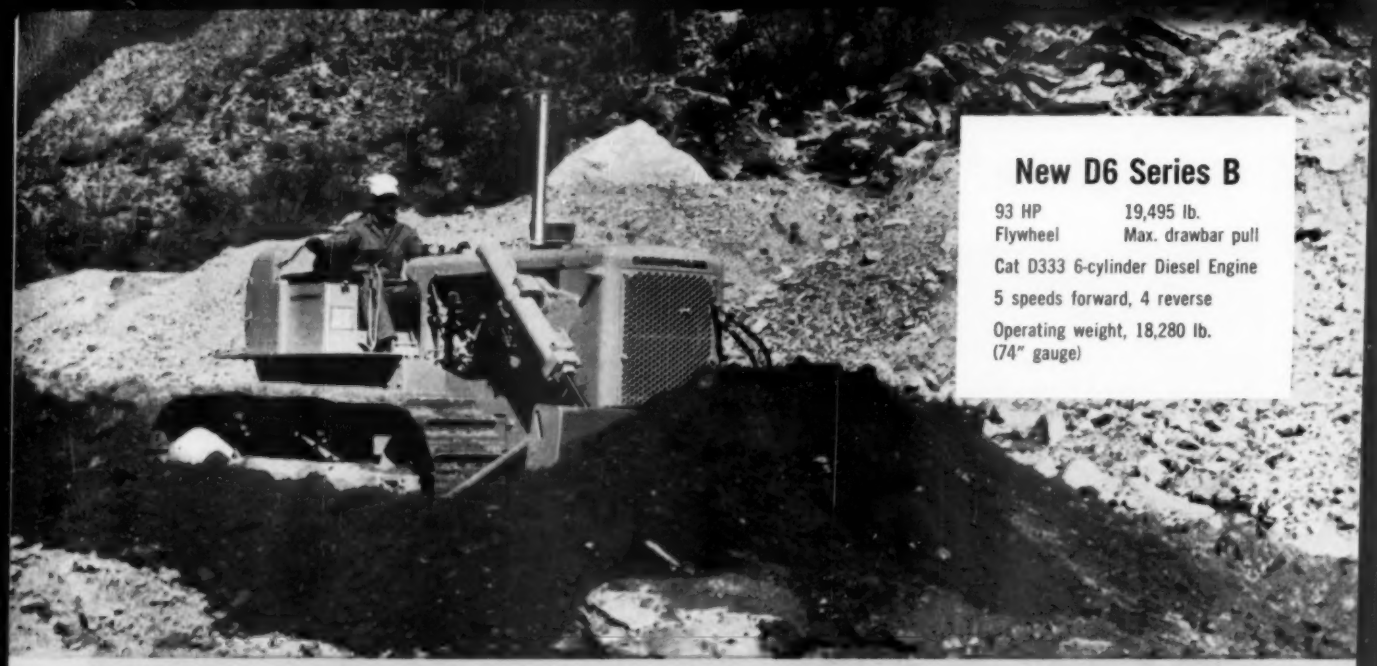


New D6 Series B

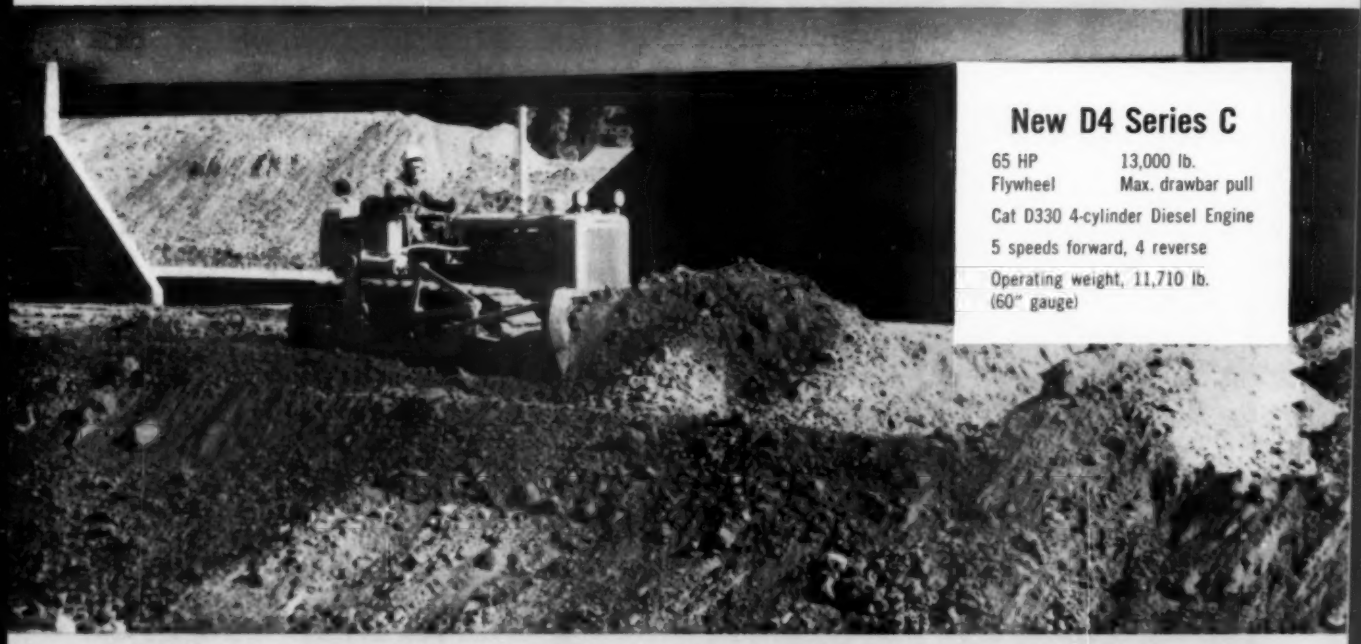
93 HP Flywheel — 19,495 lb. Max. drawbar pull

Cat D333 6-cylinder Diesel Engine

5 speeds forward, 4 reverse

Operating weight, 18,280 lb. (74″ gauge)

RUGGED MATCHED ATTACHMENTS for the D6 and D4 include Bulldozers, Tool Bar, Scraper, Rock Rakes, Winches, K/G Blade, Rippers and others.



New D4 Series C

65 HP Flywheel — 13,000 lb. Max. drawbar pull

Cat D330 4-cylinder Diesel Engine

5 speeds forward, 4 reverse

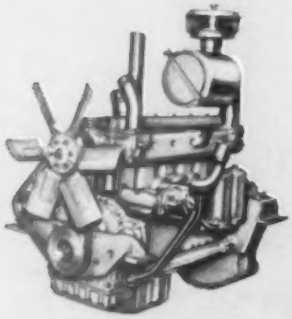
Operating weight, 11,710 lb. (60″ gauge)

IMPROVED STARTING ENGINE for both tractors has recoil starter for fast starts. Also 12-volt in-seat starting available. 24-volt direct electric starting optional.

CATERPILLAR ANNOUNCES the

completely redesigned for faster and greater production

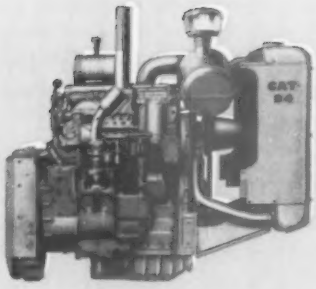
There's no time like now to upgrade your equipment spread. These two new tractors not only look different—they are different. Each, in its own class, answers your needs for higher production and greater operating economy. Some of their important new features are described on these pages. In addition to these improvements, each machine provides other famous Caterpillar features... the dry-type air cleaner,



D6 93 HP 6-cylinder Engine
Maximum drawbar pull, 19,495 lb. The D333 Engine provides power with dependability for a long life of economical operation.

New Caterpillar Diesel Engines deliver 25% more lugging ability

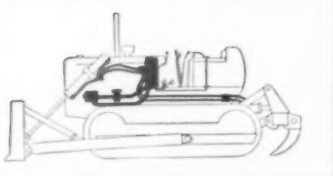
For the D6 and D4, two completely new Cat Diesel Engines. 25% more lugging ability. New compactness with new ruggedness. Famous Cat fuel injection pumps in new, easily serviceable housing. New direct acting governor that makes quick fuel adjustments, picks up loads fast. New, improved gasoline starting engine.



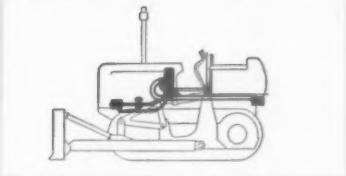
D4 65 HP 4-cylinder Engine
Maximum drawbar pull, 13,000 lb. New design of the D330 results in smooth, vibration-free performance in all speed ranges.

New integral hydraulic systems put more power where you need it

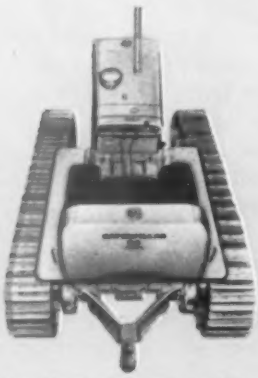
More work power at the tools—that's one of the big advantages of these new Cat hydraulic systems. Under-the-hood mounting of tank, pump and valves permits convenient routing of hydraulic lines to bulldozer or implement cylinders, frees front and rear for mounted equipment. Center-pivoted cylinder mounting on D6 gives increased blade lift/drop range for greater production. Hydraulic control system provides hand control for bulldozer and/or ripper, foot control for tilt cylinder on D6.



D6 Integral Hydraulic System
No. 165 Hydraulic Control for bulldozer
54 GPM Pump—1500 PSI
No. 143 Hydraulic Control for No. 6 Tool Bar
29 GPM Pump—1700 PSI



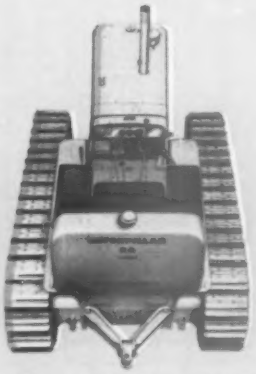
D4 Integral Hydraulic System
No. 143 Hydraulic Control with:
29 GPM Pump—1700 PSI for bulldozers
17 GPM Pump—1700 PSI for tool bars



D6 operator's compartment

New operator convenience and comfort in co-ordinated compartments

The cockpits are all new. Controls are co-ordinated to make one motion flow into the next, reducing hand movements and speeding every operation. Forward-reverse lever (new on the D4) is next to the operator's right hand to speed 'dozer cycle times. Short-travel transmission speed selector shifts gears easily, quickly. Boosters for steering clutches save muscles . . . increase efficiency.



D4 operator's compartment

New D4 Series C and D6 Series B Tractors

hydraulic track adjusters, lifetime lubricated track rollers, the oil clutch, the forward-reverse lever. Your Caterpillar Dealer will be happy to give you the complete facts about both the new D6 and the new D4 and demonstrate them on any of your jobs. The tougher, the better.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

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BORN OF RESEARCH
PROVED IN THE FIELD

THERE IS SAFETY IN NUMBERS

continued from page 116

As we look at Fig. 5 to observe the major causes of injury in cement rock quarries, the cause, "falls of persons," seems to have a silght edge over the other sources of injury, with "falls of materials" the lowest group. This may indicate that the personal, human factor is still operating to cause these injuries, pointing out an area needing more intensive effort to prevent accidents.

For some reason, lime producers have kept injuries from the fall of persons lower than in cement-rock quarries. At the same time, their record for "materials handling" is not as favorable. Here again, is an area needing more careful study and intensified safety efforts.

Granite producers seem to have an injury experience similar to that of the lime producers. Fig. 6 demonstrates that these quarry operators share a relatively high accident experience in handling materials—about 20 percent of the accidents in these quarries are in this category.

There is nothing inherent in the material in the deposit that would make any difference, because as we look at other limestone producers we see that their prime cause of injury is "machinery." These quarries regularly show this to be the cause of 20 percent of their injuries, but handling materials is around 15 percent. If one type of quarry in the same material (limestone) can have a good experience, why can't they all?

Trap rock shows a very similar picture to the limestone producer: high in machinery accidents, low in falls of materials. But, while machinery seems to cause the most accidents in trap rock quarries, the chart presents a fluctuating profile.

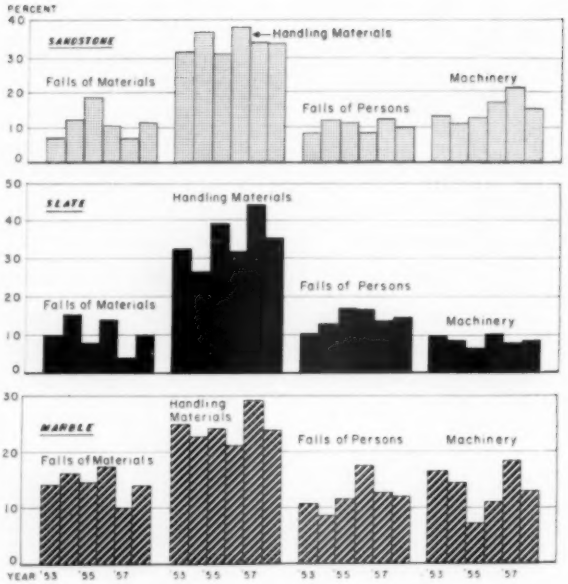

FIGURE 7—Percentage distribution of the four major causes of injury at sandstone, slate and marble quarries, 1953-58

It seems obvious that these last two segments of the quarrying industry have a lot of work to do to reduce the hazards of machinery in their quarries. Lime producers and granite quarries should look to their handling-materials hazards, while the cement industry looks carefully at its risks to persons.

In the dimension-stone industries, the problem seems to be clear on Fig. 7. Handling materials dominates the causes of injury in every year for each of these quarries. For slate and sandstone quarries, over 30 percent of injuries each year occur while handling materials; in marble, over 20 percent. It is obvious what area needs attention in these quarries.

Perhaps with the two kinds of accident analysis, the comparison of frequency rates and the comparison of kinds of accidents, I have given you some ideas on how to solve your accident problem.

For the future, the watchword for safety should be "eternal vigilance." The one thing we must always guard against is complacency, whether it be the company president or the sweeper. To quote from a poet: "It ain't the individual, or the army as a whole, but the everlasting teamwork, of every bloomin' soul." **END**

Table IV—Injury frequency rate of sandstone, slate and marble producers compared with the "all stone" rate 1942-1958

Year	Injury frequency rates[1]			
	All stone	Sandstone	Slate	Marble
1942	35.7	59.7	74.9	39.0
1943	34.0	57.6	50.1	37.0
1944	34.9	61.0	62.4	31.0
1945	32.8	57.3	50.0	43.8
1946	32.8	48.9	55.0	32.7
1947	32.4	54.0	58.9	29.6
1948	28.3	42.1	42.3	28.6
1949	26.8	44.4	54.2	38.1
1950	25.4	43.4	44.0	32.1
1951	26.2	47.2	50.1	34.6
1952	24.5	47.4	61.2	39.2
1953	23.7	44.2	51.7	32.5
1954	22.0	41.7	55.2	25.8
1955	22.0	55.2	46.9	45.2
1956	21.3	48.6	42.9	36.4
1957	23.2	52.1	59.4	28.0
1958[2]	22.2	49.1	28.5	34.6

[1]All rates rounded to one place beyond decimal; [2]Preliminary estimate

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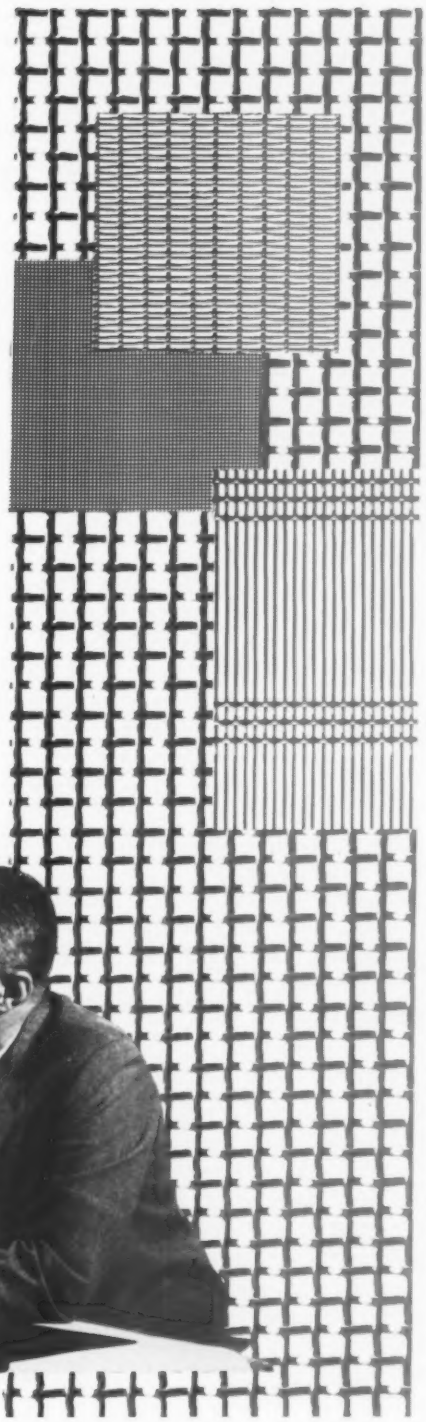
To meet all the different requirements for sizing, grading, and separating materials, W. S. Tyler has developed wire cloth in innumerable types, sizes, metals, meshes, and designs. Today, over 53,000 different specifications are available.

Matching the *right* wire cloth to your specific needs is the service provided by your Tyler sales engineer. From Tyler's unequalled range of product he has the know-how and experience to give you results.

That's *Tyler Screening Service*—use it to cut your production costs.



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Channel Rock Co. uses one button pusher to make varied products with no change in plant setup

Flexible plant boasts finger-tip control

by Vern E. Hansen

CAN YOUR PLANT make either concrete gravel or 90-percent crushed roadrock without a change in plant setup? And can 60 percent of plant equipment be shut down to cut power and maintenance costs when you make crusher-run base?

It requires a flexible arrangement, but Channel Rock Co., at Sanger near Fresno, Calif., has a spanking new 200-tph. sand and gravel plant which is doing just that. An affiliate of Pollard's Concrete Co., Fresno, the aggregate plant started crushing and washing gravel just last June.

"We believe we have one of the most flexible and efficient gravel operations in California's central valley," asserts co-owner Glenn Shingledecker. He and his partner, Hugh C. Pollard, point out that "State specs. for Class A roadrock call for 90-percent crushing. Not many plants can meet this requirement without a change in the normal plant setup, but ours can."

To get 90-percent crushing, gravel 1 in. and larger is sent to either a jaw or cone crusher. Actually, just about this much crushing is mandatory—material taken from the pit requires from 70 to 100 percent crushing to reduce it to needed sizes. River gravel requires 50-percent crushing. But since so many specs. today call for all-crushed material, the need for crushing is no detriment to efficient operation. Besides, being free of clay and other deleterious materials, the 50-million tons of reserves are of excellent quality.

To save operating dollars, "Sixty percent of the plant can be shut off when crusher-run roadrock is the only product being made. Just one of the three screening towers (the primary screen-crush tower) now operating need be employed for this purpose," Mr. Shingledecker adds.

Because it requires no washing, roadrock is stockpiled off to one side of this primary tower by a radial stacker conveyor. Should washed concrete rock be the order of the day, the second and third towers in the plant are swung back into the process flow.

At tower No. 2 minus ¼-in. slimes in the crushed fraction are removed by a washing screen. This second processing screen is employed simply by switching a gate in a chute, so rock being recycled from the crushers drops to the screen before recycling to the primary tower. And the final tower, that washes and sizes the remaining fines, is brought into play by swinging that big radial stacker over to it.

Plant-design experts were called in by Channel Rock to avoid making mistakes a new producer might conceivably commit. Engineers representing an equipment manufacturer designed the operation, working with company personnel. Thus the firm benefitted from the manufacturer's field experience and got the most efficient operation possible for its plant dollar.

What examples prove the design is efficient? One-man control is an example. Working from a central location at the primary screen-crush tower, the operator uses pushbuttons to oversee all plant operations. Second example of design foresight: For safety and convenience, stairways with railings reach platforms on the three screens. Third, when the plant is enlarged to its anticipated

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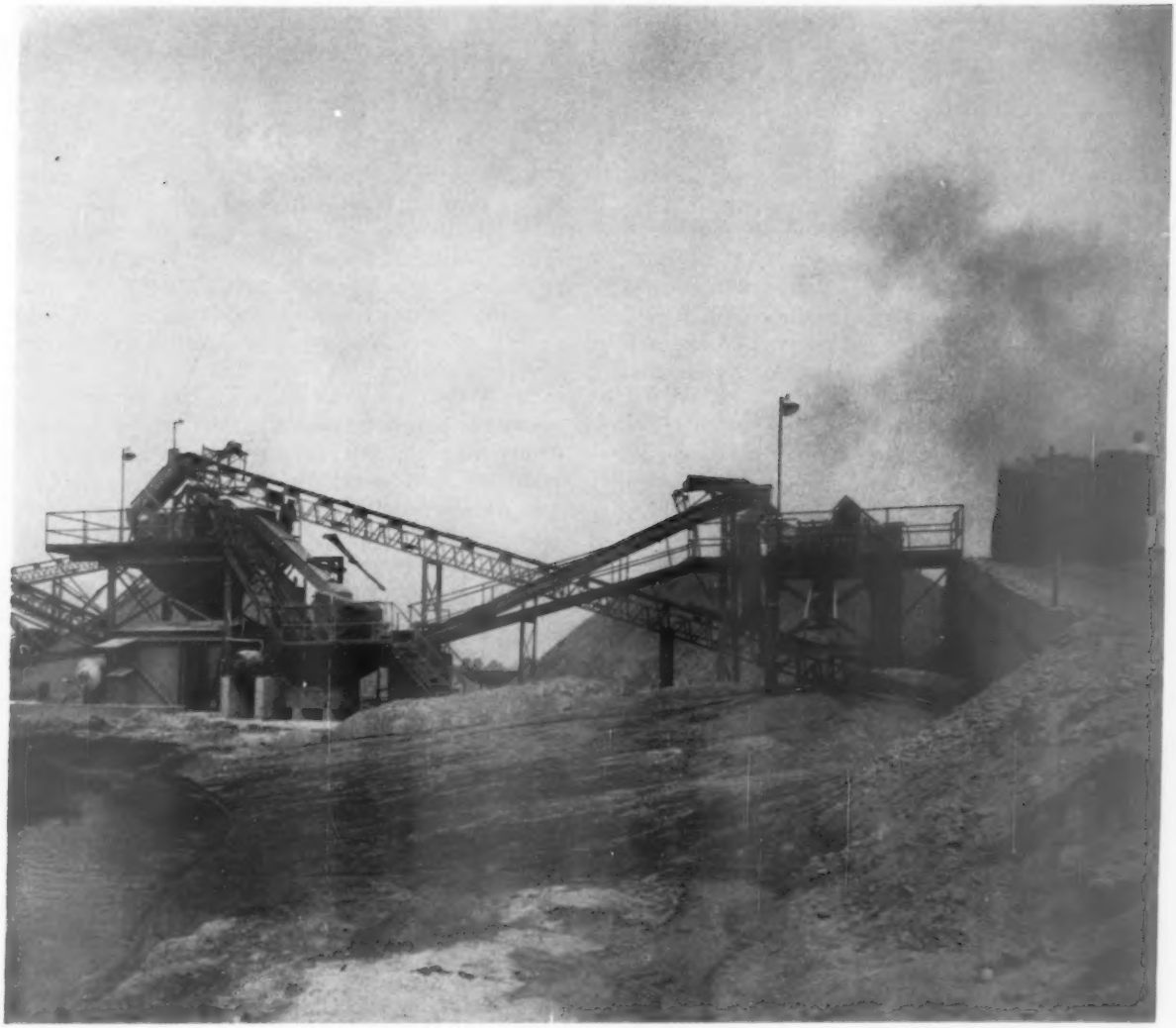
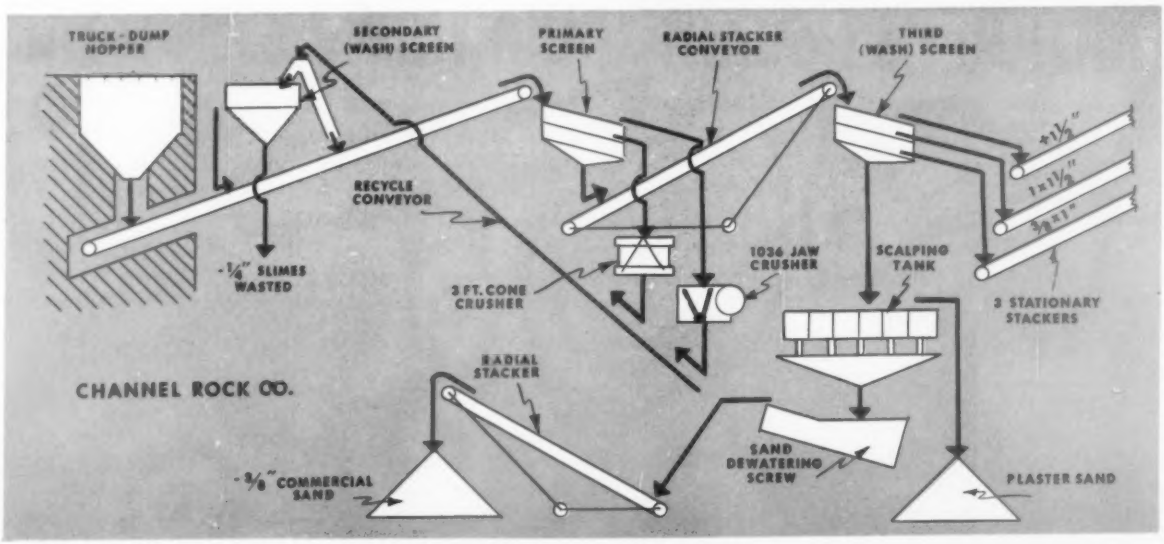


DUMPER AT RIGHT EMPTIES A LOAD into hopper at "the most up-to-date aggregate plant in California's central valley." Central tower holds primary screen, two crushers, plus operator's control house



FLEXIBLE PLANT BOASTS FINGER-TIP CONTROL

continued from page 123

2,500-tpd. design capacity, bottom-dump trucks will deposit pit-run into a cross-over hopper. This speeds unloading, for the turn-around and hoisting time required for rear-dump trucks is eliminated. Finally, reclaim tunnels stretch out under several of the finished-material piles. Since one man controls the high-speed loading of delivery trucks, and rehandling loaders are unnecessary, reclaim tunnels often save money.

Idea for the plant originated with Pollard's Concrete Co., which needed guarantees that its supply of aggregates would always come through when needed, and in high quality. So, in April 1959, co-owners Hugh C. Pollard and Glenn K. Shingledecker formed Channel Rock Co.

As Mr. Shingledecker explains it, "We went into the aggregate business to insure the best possible service to our customers. With absolute control over the source of our concrete raw materials, it follows that we are able to guarantee its consistency and quality."

Proof that Pollard's Concrete is interested in quality is its ready-mix plant layout—the young firm (five years old) was the area's first with centrally controlled batching. Pollard's also uses two-way radio on its trucks to insure efficient dispatching. The best new equipment pays off; the company is already the major supplier of the 600 to 700-cu. yd. of ready-mixed concrete used daily in the Fresno area.

But will the new aggregate business pay off too? Pollard's uses perhaps 500 tons daily, just a part of its present capacity of 1,700-tpd., and which soon will be expanded to 2,500 tons per 8-hr. day.

The answer is a solid yes, says Mr. Shingledecker. For one thing, Channel Rock supplies four other area ready-mix plants with their aggregate needs. Second, a big 200,000-ton contract has been won to supply a nearby federal project over a two-year period. Concrete work being done at Lemoore Naval Air Station requires both large and fine aggregates; Channel Rock supplies some of both.

AT CENTRAL TOWER, radial stacker belt (right) doubles as plant conveyor, lifts crushed material to final processing station. New cone crusher can be remantled in only 3½ hr., has ball bearings to eliminate mainshaft breakage

The plant is near the pit to minimize haul costs; a run of less than a quarter mile is required. About 50 million tons of usable gravel are available in a 75-ft.-deep pit deposit and in the bottom of the

Please turn to page 128

FINAL wash-screen tower is flanked by piles of finished aggregate. Reclaim tunnel runs under piles, saves labor in rehandling

Where heavyweights move job records prove...
FIRESTONES CARRY MORE YARDS PER DOLLAR!

Get Firestone off-the-highway tires and get set to make more money! From planning stage to the finished project a combination of Firestone tires and Firestone Giant Tire Service adds up to bigger profits every time. Every Firestone off-the-highway tire is built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires. You get Firestone S/F (Shock-Fortified) nylon cord bodies to guard against impact damage. A *Firestone Tire Expert* will help you match tires exactly to the job and will handle all of your tire maintenance problems to turn downtime losses into worktime profits! Call your Firestone Dealer or Store today!

Always specify Firestone Tires when ordering new equipment

Super Rock Grip Wide Base (Nylon)* Super Rock Grip Deep Tread*

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1960, The Firestone Tire & Rubber Co.

*Firestone T.M.

Enter 1042 on Reader Card

After 25 years' service in the field

MOST ACCURATE GRADATION FOR HIGH TYPE SPECIFICATIONS

Horizontal screen cloth openings are at a right angle to the fall of the material and the full area of each opening is available for sizing. More material of the proper size goes through each opening to assure closer grading of a greater volume of material. With Cedarapids, you get the accurately graded aggregate you need to meet the high-type specs so common today.

CAPACITY AND VERSATILITY TO FIT ALL AGGREGATE SCREENING JOBS

There's a size and type of Cedarapids Screen to meet practically all aggregate specification and capacity requirements. Sizes range from 3' x 8' to 60" x 16', are offered with many different screen deck arrangements, and can be equipped with spray bars to produce washed aggregate. Rip-rap screens are offered in both horizontal and inclined models.

CEDARAPIDS HORIZONTAL SCREENS

are still *First Choice** for profit

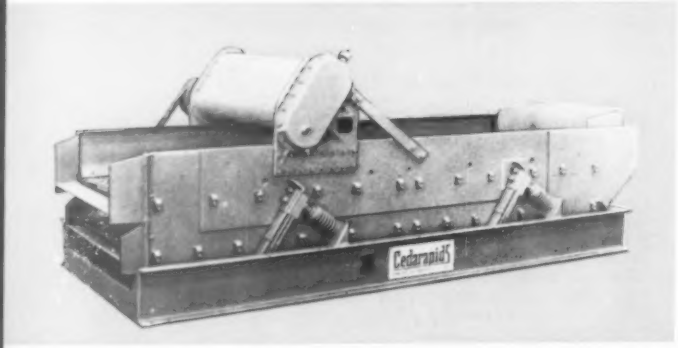
You get 12½% more screening area, up to 30% greater screening capacity, with Cedarapids Horizontal Screens—only on a *horizontal* screen is every screen cloth opening 100% effective. Think what this one Cedarapids benefit will do to increase your production and profits! And you get higher output of exact-specification products. You save money on lower maintenance costs. Cedarapids' expertly engineered design and top quality construction, typified by fully stress-relieved screen boxes and frames, assures a long, low-cost service life.

This combination of Cedarapids-engineered benefits (plus the many others there's no room here to mention) is the reason why the Cedarapids Horizontal Screen was recognized as the Number One producer in 1935—*and is still first choice today!*

Find out how Cedarapids can help you engineer more production into your plant, and cut the cost per ton. See your Cedarapids dealer today.

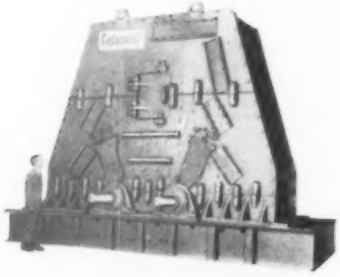
**Based on the results of a recent survey. Details upon request.*

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa



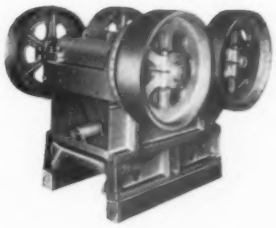
Cedarapids Built by IOWA **engineered for lowest cost per ton**

A complete line of Cedarapids components — production-balanced for your needs — produce *more* for *less*.



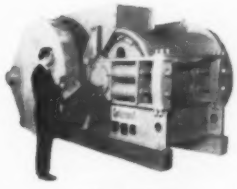
DOUBLE IMPELLER IMPACT BREAKERS

Exceptionally high capacities, plus high reduction ratios which often eliminate the need for auxiliary secondary crushers, screens, conveyors, etc., make Cedarapids Impact Breakers highly profitable in quarrying operations. Six models, from 22" x 22" to 53" x 60", meet your capacity needs. Portable models also available.



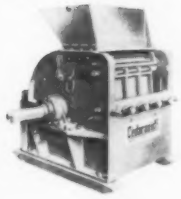
TWIN-JAW CRUSHERS

An exclusive Cedarapids design! Two movable synchronized jaws, operating at high speed, give you 40% to 100% greater primary crushing capacity than single-jaw crushers of comparable size. 5 to 10 times longer jaw life cuts maintenance. Available in three sizes. Single-jaw crushers also offered in 13 sizes.



ROLL CRUSHERS

Where high capacities of fine crushed products are required, Cedarapids roll crushers are ideal units for secondary reduction. Six model sizes offered to meet volume demands and balance primary production.



HAMMERMILLS

Exclusive Cedarapids Hammermill features produce a much finer quality of product, and size for size, produce more tons per hour than other similar types of equipment. 4 sizes available.

***Plus* bins, feeders, conveyors, vibrating grizzlies, washing plants.**

Send for this Bulletin TODAY!

It describes the complete line of Cedarapids Screens and explains the many exclusive features that help you increase your plant production . . . and profits.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa

Gentlemen: Please send Screen Bulletin CS-6. Also send details about equipment I have checked.

☐ Engineered Stationary Plants ☐ Portable Aggregate Plants
☐ Components _____ (specify type) ☐ Bituminous Mixing Plants
☐ Bituminous Pavers

Name _____ Title _____
Company _____
Address _____
City _____ State _____

FLEXIBLE PLANT BOASTS FINGER-TIP CONTROL

continued from page 124

nearby Kings River. Location near a river is an asset, since the 1,500-gpm. of water used in washing is available at moderate pumping cost as a result.

A ¾-cu. yd. shovel keeps three rear-dumps with combined capacity of 36 cu. yd. busy. When the contemplated plant expansion is finished, however, three 19-cu. yd. bottom-dumps will take rock to the crusher.

After dropping to the primary hopper, pit-run is conveyed to a 4 x 12-ft., three-deck primary screen. Oversize drops directly to the plant's two crushers. A 1036 jaw takes plus 2½ in., while the 1½ x 2½-in. fraction is chuted to a 3-ft., short-head cone. Both crushed products are next recycled by a second conveyor.

Material off the primary screen's bottom deck (1 x 1½ in.) is chuted to the cone crusher, if plenty of fines are needed. If not, it drops with screen throughs to a hopper just beneath the primary screen.

The second processing tower holds a twin-deck washing screen. Located at the head end of the recycle conveyor from the crushers, it makes separations at 1 in. and ¼ in., washing on both decks. Minus ¼-in. slimes are flumed off to one side and wasted; larger sizes now drop back to the primary conveyor. (Alternately, as the flow sheet shows, this washing screen can be bypassed entirely, should unwashed roadbase rock be needed.) Now, processing at the first two towers is complete.

The third tower does final sizing and washing. A three-deck flat washing screen, 10 x 20-ft. scalping tank and a 30 in. x 25-ft. dewatering screw are used here. Five stockpiles of washed aggregates are arrayed around the tower—several over a reclaim-tunnel system for the ultimate in low-cost and fast rehandling.

The final wash screen separates out three sizes of large aggregates: 1½-in., 1-in., and ⅜-in. Each is chuted to a stationary stacker conveyor. The smallest of the three fractions is combined with the 1-in. fraction when a single large washed aggregate is ordered.

Minus ⅜-in. fines drop to the scalping tank at the tower's base for a thorough classifying and washing. Commercial sand next goes to the dewatering screw and is stockpiled by a radial-type stacker belt. Fine plaster sand, scalped off with wash water in the tank, is stockpiled separately.

END

MAJOR EQUIPMENT REFERENCE

IN THE PIT	
Shovel, ¾-cu. yd.	Link-Belt Speeder Corp.
Haul units: 10-cu. yd., Dumptors (2)	Koehring Co.
16-cu. yd. truck	International Harvester Co.
STATIONARY PLANT	
Feeder, reciprocating plate, 30 in.	Universal Engineering Corp.
Conveyors, belt (7), total length 514 ft.	Universal Engineering Corp.
Screen, three-deck primary, 4 x 12-ft.	Universal Engineering Corp.
Crusher, 1036 jaw	Universal Engineering Corp.
Crusher, 3-ft. short-head cone	Universal Engineering Corp.
Screen, secondary washing, 3 x 8-ft.	Universal Engineering Corp.
Screen, tertiary washing, 4 x 12-ft.	Universal Engineering Corp.
Plant design	Universal Engineering Corp.
Scalping tank, 10 x 20-ft.	Eagle Iron Works
Sand dewatering screw, 30 in. x 25-ft.	Eagle Iron Works
Rehandling loader, 175 Speedall	Pettibone-Mulliken Corp.
Delivery: Tractor	Peterbilt Motors, Inc.
Tractors (2)	Mack Trucks, Inc.
Trailers	Fruehauf Trailer Co.
	Cook Bros. Equipment Co.

FIRM'S own delivery trucks are fully occupied, so contract hauler carries concrete aggregate to Lemoore Naval Air Station, 45 miles away. Tractor shovel, more flexible than reclaim tunnel, is shown loading

Now Dodge builds ém extra-big..:
GAS OR DIESEL...
G.V.W.'s to 53,000 lbs.!

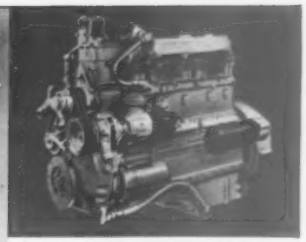
You're looking at a totally *new* kind of Dodge truck. Big, yet its short 89¾" bumper-to-back-of-cab dimension keeps it agile and easy to handle. Compact, yet its exclusive Servi-Swing fenders make it easy to service.

A truck quality-built for *toughest* construction jobs!

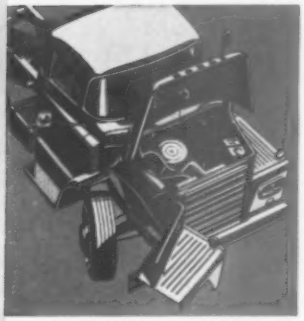
1960 Dodge Cab-Forwards offer new gasoline V-8 engines and four big Cummins diesels. Strong new heat-treated chrome-manganese frames, aluminized mufflers, big 14- and 15-inch clutches. And a whole line of new transmissions, with up to 20 speeds forward!

Big choice of models includes tandem and single-rear-axle types. Many wheelbases of ideal length for dump, rock and mixer bodies. Tractors, all the way up to 76,800 lbs. G.C.W.!

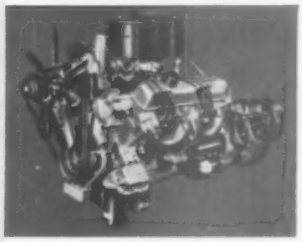
Check the new Dodge "big ones" now. Your Dodge dealer's is the place . . . and delivery is quick!



CUMMINS DIESELS are now available in Dodge for big fuel savings and extra stamina in construction hauling. Four engines available, with displacements from 464 to 743 cu. in.; horsepower to 220; torque to 605 lb.-ft.



SERVI-SWING FENDERS . . . Newest idea in engine servicing! Just flick a latch and these fenders open outward, making the engine easy to reach from either side. Check oil, water, battery without raising the hood!



NEW GAS V-8's, with 361- and 413-cu. in. displacements, deliver up to 228 horsepower. They're packed with premium features, such as tri-metal bearings and oil cooler, to insure peak performance and long life.

DEPEND ON
DODGE
TO SAVE YOU MONEY IN
TRUCKS

A PRODUCT OF CHRYSLER CORPORATION

Enter 1043 on Reader Card

How to win in the rock vs. rubber battle

A POWER WRENCH for wheel lugs speeds tire changes

by Frank W. Fox

QUARRYMEN AGREE that in the constant, one-sided battle between rock and rubber the mortality rate is tremendous. Tire replacement costs are a huge item—second only to labor among the various vehicle expense factors.

There is no permanent truce in this kind of battle. Freshly blasted rock is a major hazard to tires and a mortal enemy of low-cost tire performance. However, by continually policing the job to see that the rubber is exposed to a minimum of damage, you can keep injuries down and realize great savings.

Your chief points of attack in protecting tire costs are: (1) care to select suitable tires for each vehicle in your fleet; (2) service schedule to assure correct inflation of the tires; (3) special inspection program to overcome hazards and injuries that put tires out of service, and (4) arrangements for repair of injured tires and storage of spare stock.

If you were to ask what it takes to carry out this program of tire care, the answer is, "No more personnel, equipment or time of top management than would be required without it." There will be less expense, by far, than would be necessitated by emergency delays and problems arising from lack of such a program.

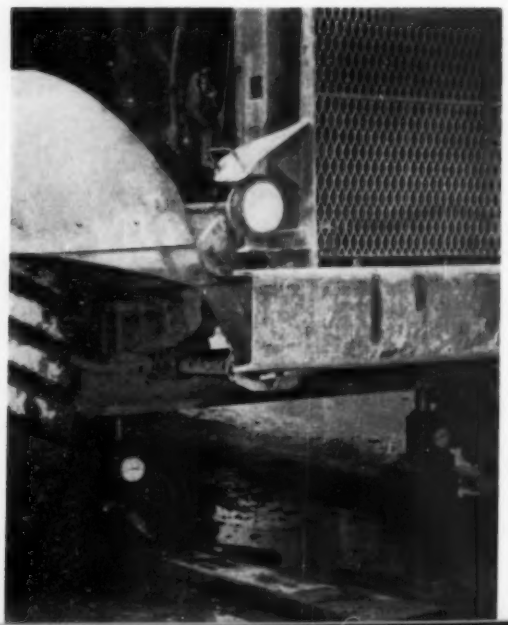
When you buy any equipment with tires—scrapers, trucks, graders, loaders, etc.—always check the tire options of the manufacturer. The maker selects his standard original tires for average loads, probably far under the ones your vehicles will carry.

To know what the actual tire loads are likely to be, it is best to get weights of typical loads right on the job. This can be done with little trouble on portable weighing jacks that tire companies make available to customers at their branches in every locality.

The tire industry has set up load recommenda-

Please turn to page 136

WEIGHING JACKS will help you determine how heavy a load tires must carry



Enter 1001 on Reader Card

Cat DW21-PR21 units handle rock "on the double"

Increasing production is one of the soundest ways to cut quarry costs. Caterpillar DW21 Tractors with Athey PR21 Rear Dump Wagons were designed to help quarry operators do just that. Here's why:

They're big, rugged and an easy shovel target. They have a low center of gravity and are maneuverable.

The payoff of these features is in top production. For example, on the job pictured below, there were three Cat DW21-PR21s at work. The units were required to maneuver in limited room on benches and steep haul roads. Material included shot rock and sandstone. On haul lengths averaging 300 yards, the units handled 275 cu. yd. an hour.

DW21 Series G now 345 HP

Now the new DW21 Series G is matched to the 22.5 cu. yd. PR21 for even faster production on the toughest jobs. Compared with the model it replaced, it has new HP—345 (maximum output) for an increase of 8%. It also has 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, the horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics of the Cat Engine.

Get the complete facts on the Cat DW21-PR21 from your Caterpillar Dealer. Ask for a demonstration. Pick a tough job—see for yourself how this giant handles the hard work!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work on a narrow bench. PR21's special steel withstands impact, abrasion and corrosion.

ROLL FAST! Two of three DW21-PR21 units on the job. DW21 combines high travel speed with excellent torque characteristics. The PR21 has a 22.5 cu. yd. heaped and 62,000 lb. capacity. All this adds up to fast cycles, top production.

DUMP FAST! PR21 has hydraulic hoists for quick and complete dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure traction.

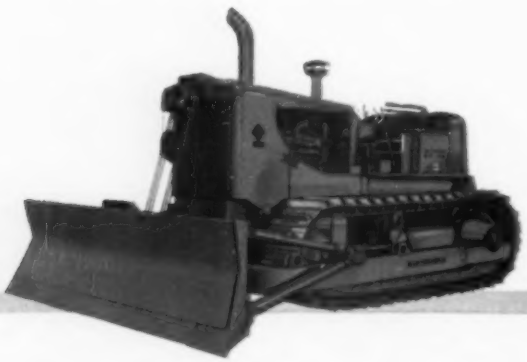
MIGHTY... HEALTHY... POWER

Whether your choice is the 225-hp HD-21 or the 150-hp HD-16, you get from 8½% to 27% more efficient engine operation than from other crawlers.

This fuel-pinching efficiency is a fact! Your Allis-Chalmers dealer will show you actual proof of up to 27% fuel savings in the Allis-Chalmers 16000 or 21000 engines over units of comparable size. He'll tell you why they run cleaner . . . how they "sip" fuel to earn the title "industry's healthiest engines."

Six crater-shaped pistons develop 225 hp in the HD-21, 150 hp in the HD-16 . . . both at an easy 1825 rpm. Coupled with torque converter drive, they provide plenty of rough dozing lugability . . . all the power you'll ever need.

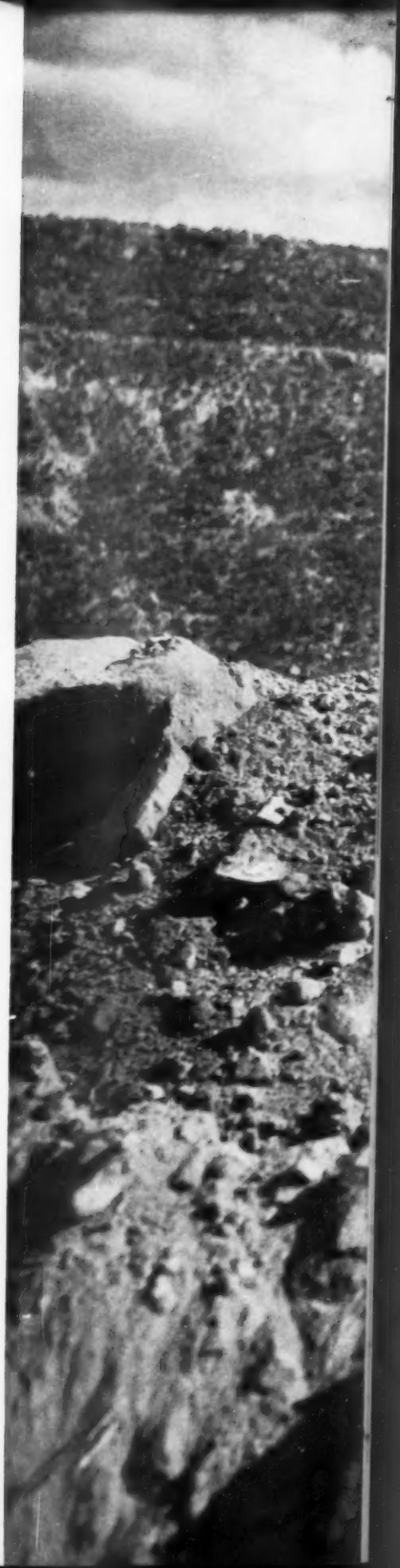
These big Allis-Chalmers tractors are built for mighty tough service. Shock-absorbing all-steel main frame, durable double-reduction final drives, certified permanent lubrication of tapered roller bearing truck wheels, idlers and rollers, and extra tough track keep them going season after season with a minimum of maintenance. Your Allis-Chalmers construction machinery dealer will be glad to show you an HD-21 or HD-16 soon. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



move ahead with

ALLIS-CHALMERS

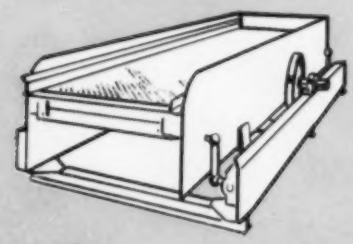
power for a growing world



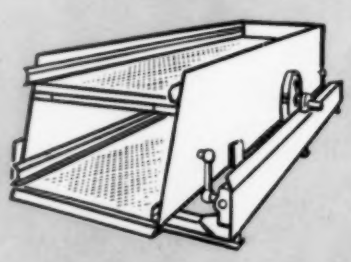
get profit insurance . . .
with "TIME-CONSCIOUS" SECO SCREENS
in your plant

Yes, it's good to see the truckloads weighing out . . . BUT BACK OF EACH TRUCKLOAD IS YOUR COST OF PRODUCTION. THIS IS WHERE YOU MAKE OR BREAK YOUR PROFITS! Take a fresh look at your plant . . . and especially your screens before you start up for the 60's. If you're not set to get high production of accurately sized materials to meet today's strict specs . . . then you are going to be running "out of the money". If your screens can't stand the gaff of peak season production requirements, down time will syphon off the cream of your profits. TAKE A GOOD LOOK, RIGHT NOW! IF YOU NEED NEW OR REPLACEMENT SCREENS CONTACT SECO. OUR WHOLE BUSINESS IS TO PROVIDE OPERATORS WITH SCREENS THAT TAKE THE GUESSWORK OUT OF MAKING PROFITS . . . BECAUSE THEY PRODUCE HIGH TONNAGES OF ACCURATELY SIZED MATERIALS HOUR AFTER HOUR, YEAR AFTER YEAR, WITHOUT A WHIMPER. ASK ANY SECO OPERATOR!

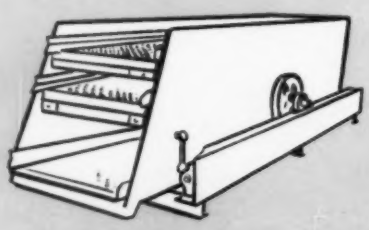
SINGLE DECK



DOUBLE DECK



TRIPLE DECK



... but this is where you make the PROFIT!

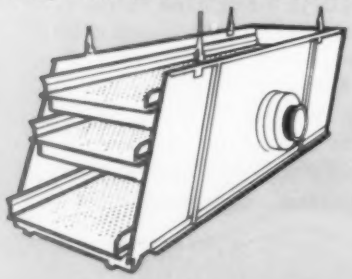
SECO

"TIME CONSCIOUS" VIBRATING SCREENS

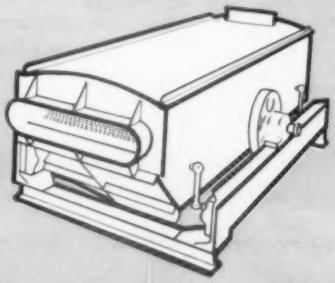
OVER 450 MODELS • FOR SCREENING EVERYTHING
FROM AG-LIME TO RIP-RAP • ALL BACKED
BY SECO QUARTER CENTURY OF DEPENDABLE,
HIGH VOLUME, LOW MAINTENANCE PERFORMANCE
ON TOUGH SCREENING JOBS COAST TO COAST
SEND FOR FREE LITERATURE
SECO 4-BEARING SCREEN CATALOG #204
SECO TWIN BEARING SCREEN BOOKLET TB-21

SCREEN EQUIPMENT COMPANY, INC.
Buffalo 25, New York

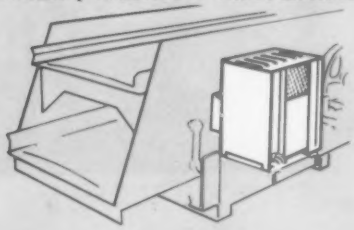
1½, 2½ and 3½ DECKS



DUST HOUSED MODELS



FACTORY INSTALLED ELECTRIC HEATERS FOR DAMP, STICKY MATERIALS



HOW TO WIN IN THE ROCK VS. RUBBER BATTLE

continued from page 130

tions and correct inflations for each size of tire, taking into consideration ply rating, kind of service and speed. The load limits vary with changes in each of these factors for any size of tire, so at this point it would be wise to check carefully the Tire & Rim Association tables.

Although overloads should be avoided, this doesn't mean that recommended limits may never be exceeded. All tires have a safety factor to handle a margin of abuse. Occasional overloads will probably have little effect on tire life, but continued overloads of more than 10 percent of rated capacity will prove expensive.

Extra inflation, up to 10 lb. above that recommended in the Tire & Rim Association tables, tends to correct the extra deflection due to overloading; however, it puts excess strain on the cords in the tire body and over-all results may reduce tire life.

Effect of overload on tire life

With max. recommended load, tire life = 100 percent
With 10 percent overload, tire life = 82 percent
With 20 percent overload, tire life = 70 percent
With 30 percent overload, tire life = 58 percent
With 40 percent overload, tire life = 48 percent
With 50 percent overload, tire life = 40 percent

Tire tread designed for the hauling surface is another choice you must make, following that of size and ply rating. In the lines of larger tire makers, many sizes are made with as many as six different treads to choose from. One, labeled rock type, is produced for hauls of crushed rock; it has more rubber and better resistance to cutting. It will outlast other types by a margin of wear far exceeding that of price.

Rock-type tires are now available with super-heavy treads for vehicles taking tires of sizes 14.00 to 18.00 in cross section. This line provides up to 50 percent more tread for only 15 percent more cost. And the extra weight is practically all in the tread. These "super" rock tires should be used only where speed is moderate and on short hauls, because of their extra thickness and tendency to build up internal heat. Another special type of tire designed to reduce effect of cuts in rock service has steel wires or wire-mesh layers between tread and cord body. Tires of this type are being made chiefly on a test basis. Good results have been reported by pioneer users. It may pay you to investigate them.

Evenness and rate of tread wear become a problem for vehicles hauling material that is reduced to small size before loading or for those loading from hoppers. Haul roads have lower cutting hazards than quarry floors, so here your best bet is a tire with an over-all nonskid tread pattern, generally known as the trailing wheel type. Another type, the special traction type, is dictated by jobs where soft going is encountered.

The tread options mentioned are available not only for scrapers, wagons and trucks, but also—in some of the sizes and special types—for graders, front-end loaders and industrial tractors. Traction-type treads are standard in most cases, but some rock-type sizes are available to give longer wear in tough going.

For the aggregate hauler and for general-duty trucks with tires under the 14.00 size, manufacturers provide an "on-and-off-the-road" type. It wears well on hard roads and has some extra traction for soft areas at loading and delivery points. It has a reinforced body and heavier tread than tires sold strictly for highway use, and proves less costly for all but pit operations.

Tire care is as important as tire selection. Performance will be disappointing unless you follow

Please turn to page 138

THIS MONSTER is a rock-type tire for use in quarries

AN EDITORIAL REPORT on hauling methods at Anna Quarries, Inc., digested from the September, 1959, issue of "Pit and Quarry" magazine.

Anna Quarries MODERNIZES HAUL FLEET WITH 15-TON DUMPTORS

"Nearly a half century of operation has not lulled the management of Anna Quarries, Inc., Anna, Ill., into a complacent attitude, nor put them in a rut. This 300-t.p.h. plant, one of the largest in southern Illinois has from time to time undergone revision, and it has been equipped with the most efficient operating units available."

Quarry depth: 150 to 175 feet

"Latest step in the continuing improvement program involved quarry and plant feed operations. In view of many years' operation, the quarry is now 150 to 175 ft. deep. Within the last 10 years, the company has acquired a number of 8-ton capacity model 60 Koehring Dumptors." (The Dumptors haul quarry-run stone from shovels to a hopper at intermediate quarry level. From there, a steeply-inclined cableway system carries stone to top of plant.) "Last year, due to further deepening of the quarry, the hopper and cable-way system were moved down another 50 feet."

20% adverse grades

"At that time, experiments were conducted in interest of gaining more haulage capacity. None proved to have the speed and mobility required to negotiate the 20% grades in the confined area, or the limited room for maneuvering at hopper ramp. The latter condition, in particular, focused attention of management on the potential of newer model 100 Koehring Dumptors (15-ton capacity), which, with pivoting seats and dual steering wheels and controls, permits the driver to operate in either direction with ease and speed."

7 Dumptors in quarry fleet

"Two 15-ton units were acquired early in 1959, and put to use in widely separated sections of the operation. One new Dumptor joined the five older, smaller-capacity machines in the quarry, and the other is used at the top for stockpile rehandling. The haulage units transport material up a series of ramps to the hopper, where they discharge via free-fall gravity dump (older machines), or by either free-fall or controlled gravity dump on the newer machine. From the hopper, rock is transferred into cable-cars for transport to top of plant."

P & Q SEPT., 1959

15-TON DUMPTOR facts at a glance:

- **Pivoting seat, 2-way controls**
- **24 mph speed, either direction**
- **constant-mesh transmission**
- **Hydraulic clutches for easy speed-range selection**
- **Torque-converter drive**
- **Power steer; 4-wheel airbrakes**
- **30,000 lb. payload capacity**
- **28½% gradability**
- **Instant, or controlled dump**

How about a Dumptor demonstration on your work? Get in touch with Koehring distributor today — or send coupon for facts-by-mail!

To: Koehring Division, 3026 W. Concordia, Milwaukee 16, Wis.
Send us ☐ *literature* ☐ *specs. on 15-ton 100 Dumptor®*

NAME _____ TITLE _____
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STREET _____ K20 RP
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HOW TO WIN IN THE ROCK VS. RUBBER BATTLE

continued from page 136

STONES wedged between duals are hazards to tire performance that your maintenance men should watch for

through with a regular program of tire care. If yours is a fleet operation, you should have one or more men responsible for seeing that tire inflation is regularly checked and kept at proper level.

An underinflated tire will flex excessively, causing internal distortion of the tire body and high temperatures inside. These conditions can bring on separation of cord plies, or between plies and tread, so that tires may be ruined long before treads are outworn.

Pressures recommended in the tables permit tires to hold a normal shape; that is, with enough deflection to cushion the machine, to give full ground contact for traction and flotation and to envelop irregularities in the road so as to reduce cutting and bruising.

Daily inspection to spot leakers, and checks weekly or oftener with an air gauge to assure boosting inflation before a drop of more than 5 lb. should be a firm part of your service schedule.

At the start of a new job, or when material weight has changed, weights should be taken and a complete list of inflations for the tires should be posted as a control. A truck-mounted compressor for inflating tires at any point on the job is essential for keeping interference with hauling schedules at a minimum.

When checking hazards to the tires, the first place to look is on the vehicle itself. Your tire service crew should watch for rocks wedged between duals, for dozer slashes and for damage to tires from bent or broken parts of the machines. Bent axles and misaligned wheels will leave evidence in the form of unusual tread wear.

Cuts in treads which leave an end flopping should be trimmed to stop tearing, and jabs in the treads into which stones and dirt can wedge should be cut away. Neglect to take action permits damage to the tire body. When tread cuts are discovered, they should be probed and all foreign matter cleaned out. If the cut is into the plies of the cord to the extent of ⅓ of the total number in the tire (for example, 5 or more cut in a 24-ply tire), removal for repair is in order.

Next, inspection must include the haul roads and loading and dumping areas. Rock spillage on the compacted surfaces is the likeliest cause of tire cutting when struck by vehicles moving at a fast clip. The tire service crew should report on laxness in clearing the haulways so supervisors can eliminate this source of tire injury.

A fourth point, arranging for repairs and spare storage, rounds out your tire care program. Even the largest tires can be successfully repaired and retreaded. You will get mileage to more than re-

Please turn to page 170

Service Load and Inflation Table

Tires for Earthmoving, Mining and Logging Service for Short Hauls

TABLE EM-3D — MAXIMUM SPEED — 30 MPH

Tire Size	Ply Rating	Tire Loads at Various Inflations													
		25	30	35	40	45	50	55	60	65	70	75	80	85	90
7.00-20	10		1810	1980	2140	2300	2440	2580	2710	2850					
	12		1810	1980	2140	2300	2440	2580	2710	2850	2980	3100	3210		
7.50-20	10		2030	2220	2400	2570	2740	2900	3040	3190					
	12		2030	2220	2400	2570	2740	2900	3040	3190	3330	3470			
8.25-20	10		2390	2620	2820	3020	3220	3400	3580						
	12		2390	2620	2820	3020	3220	3400	3580	3750	3920	4070			
9.00-20	10		2840	3100	3380	3590	3830	4050	4250	4460					
	12		2840	3100	3380	3590	3830	4050	4250	4460					
10.00-20	12		3200	3500	3780	4050	4310	4560	4780						
	14		3200	3500	3780	4050	4310	4560	4780	5020	5250				
10.00-22	12		3400	3720	4030	4310	4590	4850	5100						
	14		3400	3720	4030	4310	4590	4850	5100	5350	5590				
10.00-24	12		3620	3960	4280	4580	4870	5150	5420						
	14		3620	3960	4280	4580	4870	5150	5420	5680	5940				
11.00-20	12		3540	3870	4190	4480	4770	5050							
	14		3540	3870	4190	4480	4770	5050	5300	5560					
11.00-22	12		3760	4110	4440	4760	5060	5360							
	14		3760	4110	4440	4760	5060	5360	5620	5910					
11.00-24	12		3990	4360	4720	5060	5380	5700							
	14		3990	4360	4720	5060	5380	5700	5980	6270					
13.00-20	14		4030	4390	4750	5080	5400	5740	6030						
	16		4030	4390	4750	5080	5400	5740	6030	6320	6600				
12.00-24	14		4520	4930	5330	5720	6080	6460	6780						
	16		4520	4930	5330	5720	6080	6460	6780	7110	7420				
13.00-24	16		5280	5820	6280	6740	7170	7580	7980	8370	8750				
14.00-20	12		5620	6140	6630	7100									
	16		5620	6140	6630	7100	7550	8000	8400						
	20		5620	6140	6630	7100	7550	8000	8400	8820	9200	9580			
14.00-24	16	5630	6270	6850	7400	7930	8430	8920	9400						
	20	5630	6270	6850	7400	7930	8430	8920	9400	9830	10280	10690			
	24	5630	6270	6850	7400	7920	8430	8920	9400	9830	10280	10690	11100	11510	11930
16.00-20, 21	16	6870	7430	8120	8780	9410									
	20	6870	7430	8120	8780	9410	10010	10580	11130						
16.00-24, 25	16	7370	8200	8970	9700	10400									
	20	7370	8200	8970	9700	10400	11070	11710	12300						
	24	7370	8200	8970	9700	10400	11070	11710	12300	12900	13490				
	28	7370	8200	8970	9700	10400	11070	11710	12300	12900	13490	14020	14580		
18.00-32	24	8940	9940	10780	11630	12470	13280	14050	14740	15430	16150				
18.00-24, 25	12	8580	10070												
	16	8580	10070	11170	12020										
	20	8580	10070	11170	12020	13020	13980								
	24	8580	10070	11170	12020	13020	13980	14880	15720	16500					
	28	8580	10070	11170	12020	13020	13980	15220	16000	16780	17500				

NOTE: Single underscoring denotes maximum recommended loads.

how many hours per week do your crawler drill rigs just...

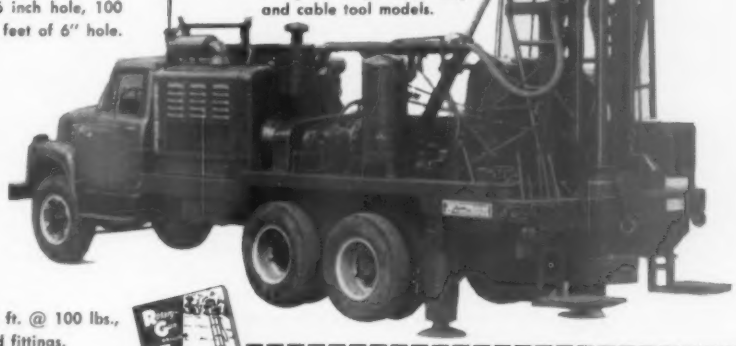
sit?

Here's one way to get more productive hours from the dollars you tie up in blast hole equipment: Switch from crawlers to work-and-run truck-mounted rigs . . . like the Speedstar 30-AW.

With *one* truck-mounted 30-AW, you can handle heavy-duty blast-hole drilling at *several* scattered pits . . . do exploration and core sampling work whenever and wherever needed . . . make extra profits handling water-well or other contract drilling. Yet, the versatile 30-AW compares favorably in cost with crawler rigs of comparable production capacity.

To investigate the possibilities further, send coupon for new Stardrill-Keystone bulletin on truck-mounted all-purpose rotary drill rigs. Mail coupon to:

STARDRILL-KEYSTONE
Buffalo-Springfield Co., Springfield, Ohio
(A Division of Koehring Co.)



The 30-AW is a combination air-water rotary . . . handles all current makes of down-the-hole guns. Larger companion models available with PTO or outboard . . . plus many other rotary and cable tool models.

SPECIFICATIONS

30-AW Combination Rotary Gun Drill

CAPACITY: Air-drilling . . . up to 500 feet of 6 inch hole, 100 feet of 8¾" hole. Fluid drilling . . . up to 1000 feet of 6" hole.

ENGINE: Outboard Model 6031-C GMC Diesel, 6-cylinder with standard accessories.

ROTARY TABLE: Mechanical drive gives you 10 times more torque, 15% faster drilling speeds than hydraulic types . . . at same time, cuts maintenance costs.

PULLDOWN: Manual control, automatic feed, chain operated with 4-speed transmission, 25,000 pound pulldown.

AIR COMPRESSOR: Two-stage, 6-cylinder, 500 cu. ft. @ 100 lbs., completely equipped with valves, storage tank and fittings.

MUD PUMP: A 4 x 5 centrifugal pump, complete with companion flanges, lubricator, suction and discharge hoses.

DERRICK: Round, tubular construction, 30,000 pound working capacity, accommodates 20' kelly, 15' drill pipe.

LEVELING JACKS: Hydraulic, one front, two rear. Operated from operator's position.

Yes, send copy of rotary drill bulletin to . . .

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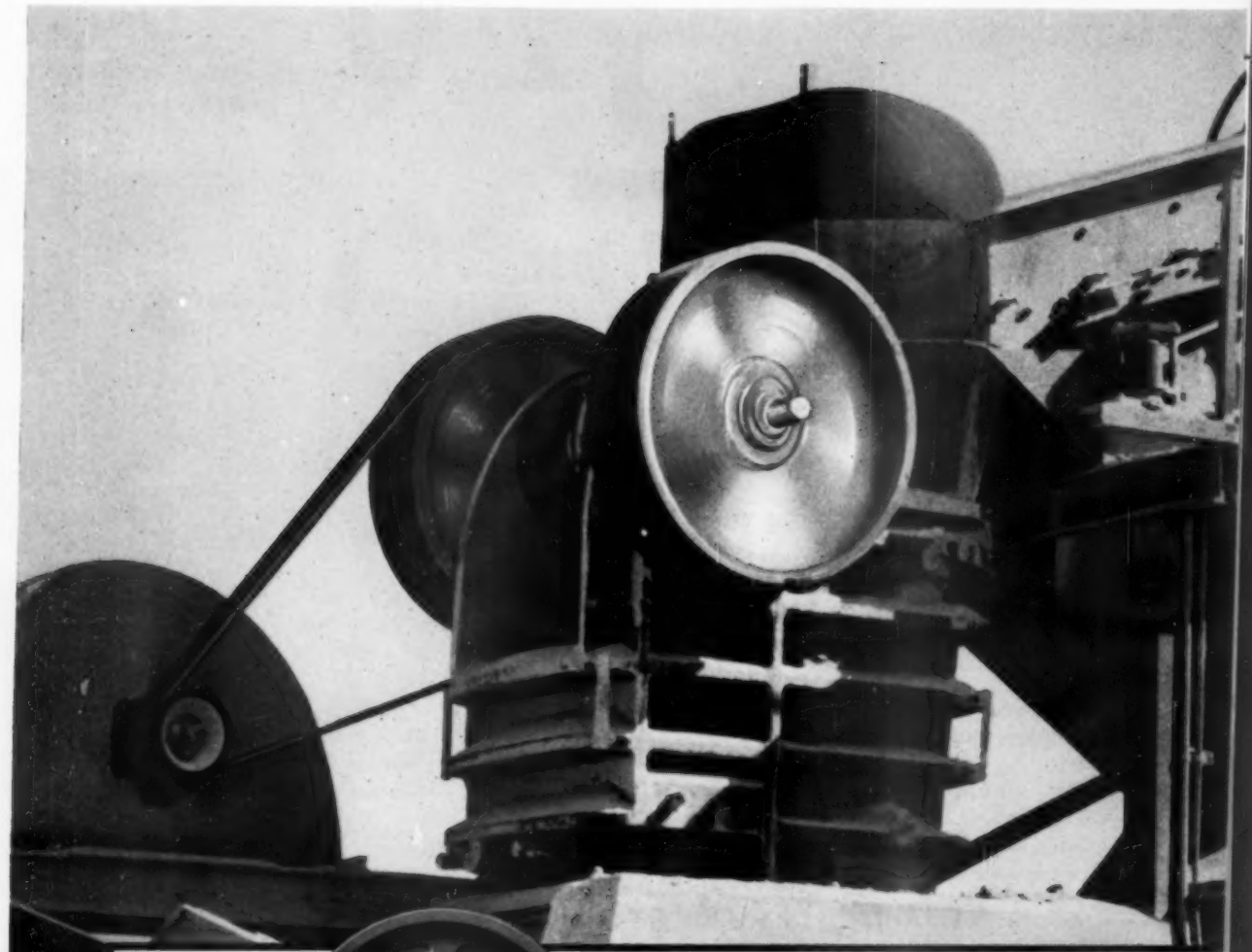
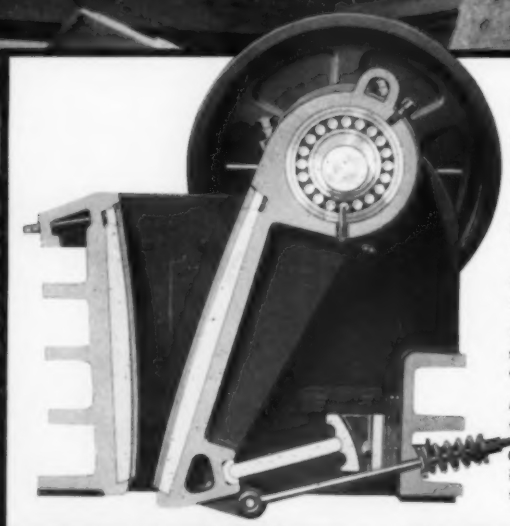
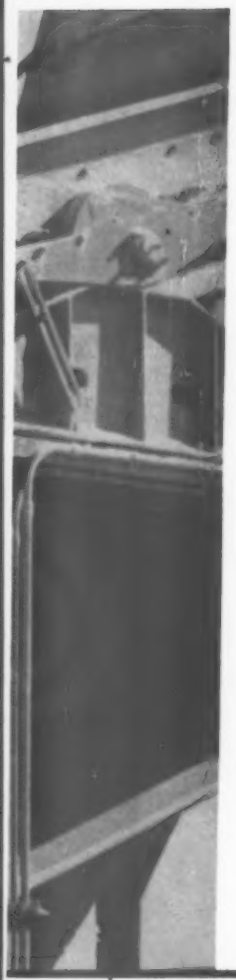




Grizzly-King Advantage	How You Benefit
Curved, replaceable jaw dies are up to 37% deeper than other makes.	More crushing area, and better nip angle . . . means higher production at lower cost per ton.
Up to 16% greater eccentric throw, made possible by special frame and shaft design.	Greatly increases productivity . . . conserves power.
Contoured upper jaw area, with set-back shaft.	Takes larger-size feed, minimizes bridging of slabby rock.
Up to 26% larger-dia. alloy shaft, with inner-adjustable radial-thrust tapered roller bearings.	Absorbs heavy shock loads. Bearing clearance can be adjusted in field for better wearing efficiency.
More flywheel weight than other crushers (details on request).	More sustained crushing force . . . higher efficiency.
Cast-steel frame, with heavy reinforcing ribs. Special frame design for every jaw size.	Reduced vibration and wear for longer productive service.



How to figure the true cost of a jaw crusher

The true cost of a crusher extends over the *life of the machine*. Over a normal life-span of 20 years, differences in productivity and cost-per-ton can far outweigh the importance of original price as a cost factor.

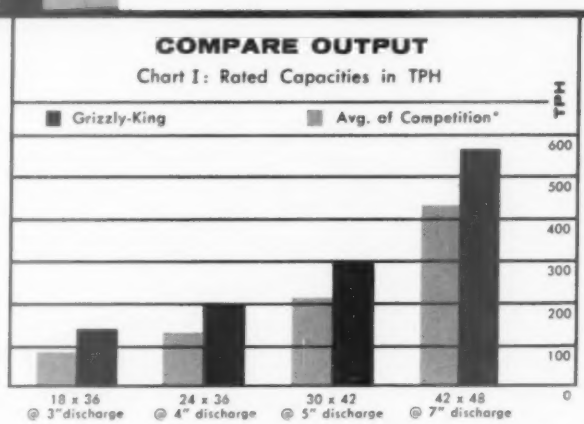
For example, consider the tremendous difference in hourly output among jaw crushers in the same size range. A comparison of manufacturer specs (Chart I below) shows that Grizzly-King is rated 40 to 120 tons per hour higher than the average of other comparable-size makes. You can see what this extra productivity can mean in terms of costs and profits: A "plus" of just 40-tons-per-hour, over a 1200-hour season, figures out to 48,000 additional tons of material per year!

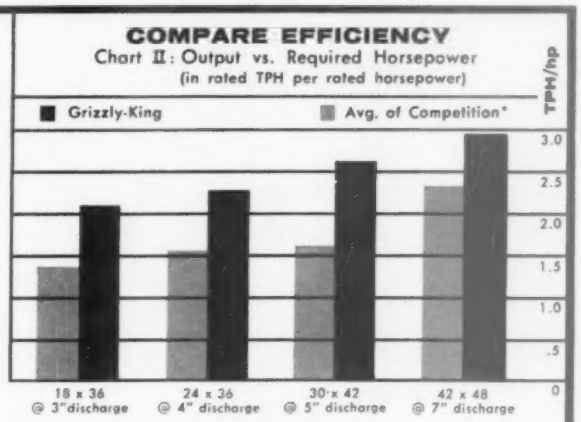
Another item that doesn't show on a crusher's price tag is fuel consumption. Field performance records show that fuel (or electric power) requirements can actually vary as much as 100% between jaw crushers of comparable output. Factors involved are size and weight of flywheel, length and curvature of jaw dies, efficiency of crushing stroke, and overall balance of machine. Chart II puts these variables together . . . shows how Grizzly-King gives you up to 62% more rated tonnage per unit of h.p. required.

No less important are lifetime maintenance costs . . . in parts, labor, and downtime. Take a look at Grizzly-King design advantages on opposite page . . . see how you get more crusher to start with, to save "hidden" costs later on.

Want specific figures to help you arrive at total costs of your next jaw crusher? See your Lippmann distributor or send coupon below.

LIPPMANN
Engineering Works, Inc.
Milwaukee 14, Wisconsin





* Competitive figures above based on latest available specifications of Smith, Universal, Lima, Diamond, Iowa, Pioneer, Rogers, and Gruendler, wherever same or comparable sizes exist, and at equivalent discharge settings. To simplify chart, median figures are used where specifications are given in a minimum-to-maximum range.

Mail to:

LIPPMANN
Engineering Works, Inc.
Milwaukee 14,
Wisconsin

Yes, send details on how I can increase profits with Grizzly-King jaw crushers

NAME ..... TITLE .....
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How to meet the shortage of skilled workmen

by Robley D. Stevens*

THE PROBLEM of meeting the shortages of skilled workmen is by no means a new one. But many employers engaged in rock products and material handling industries are now faced with the task for the first time since World War II.

Older workmen are a bigger asset than you may realize. Now is a good time to start training them as skilled workmen. While millions of these workers are holding jobs today, millions more have skills and talents not being effectively utilized.

What is your company doing about the problem? The shortage of skilled manpower in the rock products industry exists and it is likely to get worse in the future. Careful selection and placement of older skilled workmen will help solve the matter.

During the past few years employers have come to realize the advantages of older workmen. It has been estimated that by 1960 over 25 percent of the country's manpower will be 50 years old and over. Even more impressive is the fact that today there are over 20 million people over 50 years of age who are working. These represent only a small portion of all the older workers who are available.

When should your company begin using older workers? The answer is simple—right now. Your company should ask itself these questions:—Does the company need skilled workers? —Are workers

Please turn to page 144

*Management Consultant, Washington, D.C.

Versatile Armco Liner Plate Makes Ideal Conveyor Tunnel

New steels are born at Armco

Armco Liner Plate, used primarily for underground tunneling can be utilized in many different ways. The aggregate conveyor tunnel in the photo above is a good example. Note how equipment for the handling of materials such as sand, rock and gravel is readily bolted to the liner plate in various positions. This structure can be used in permanent central distributing plants, and also on large construction projects where it can be easily dismantled when the job is completed and moved to another site. Lightweight and easy to assemble, Armco Liner Plate is strongest pound for pound. For complete product data, write to: Armco Drainage & Metal Products, Inc., 4750 Curtis Street, Middletown, Ohio.

Armco Liner Plate Storage bins are used in gravel plants to hold graded sizes of aggregates. Graded gravel is carried from bins on a belt conveyor.

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

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HOW TO MEET THE SHORTAGE OF SKILLED WORKMEN

continued from page 142

over 50 readily available? —Is there a plan for future manpower utilization? —Can older workers be used effectively?

It is never too late to begin exploring the possibilities of using older workers. But, as many an employer in this industry has discovered, wanting a skilled worker is one thing and getting him is quite another. On the other hand, older workers of skill and experience can be had.

Health and competence is the only valid basis for hiring them. They must be qualified to perform the duties of the job you have in mind, and they must be able to get along with others to avoid friction or jealousy on the part of younger people.

Virtually all personnel executives contend that there is less labor turnover among older workmen than among younger ones. Older workmen are more loyal, less demanding and more appreciative of what is done for them.

Experience indicates that they are absent less than younger ones. The United States Bureau of Labor Statistics indicates that older workers—those past 50 years of age—are absent only a little more than three days out of every one hundred. They have an advantage of greater experience both in the performance of their jobs and also in adapting themselves to the employment climate.

The record shows that older workmen can get along with people, use work improvement methods and build morale. They also are more painstaking and accurate, and their mature judgement can be of real value to an employer. They need less supervision and are careful in job assignments because they take fewer risks than younger employes.

As high-powered operated equipment is used to lighten tasks, physical strength of workers is becoming less important. In fact, industrial physicians say that older workers, as a rule, possess greater emotional balance and understanding than young people. The age of an older worker is not important as long as he has the basic qualifications —training, experience and health.

Unbelievable as it seems, while high salaries for young people have received a lot of publicity in recent years, older workers are still willing to accept less compensation than younger ones. This should be an inducement to any economy-minded employer. Many older workers are seeking only part-time employment because the present law allows the individual to earn $100 a month and still obtain Social Security benefits. In short, older workers will be glad to get a job.

Of course, rewards motivate interest. They never fail. So, reward the older worker with tasks that give him a chance to show his improvement. Let him take some of the load off your shoulder. This will please him, and give you more time for analysis and action to over-all company problems.

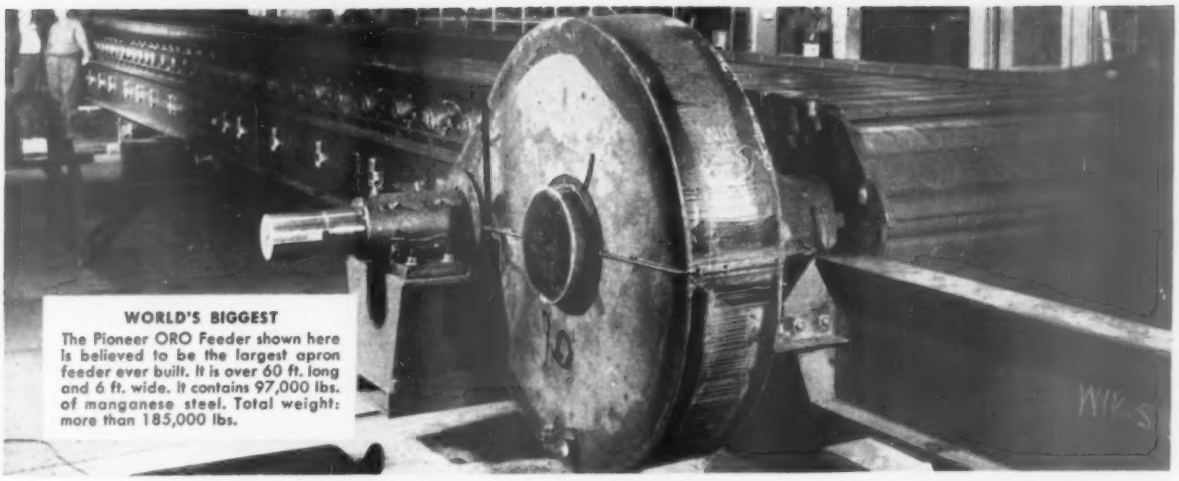
If the management is favorably impressed with the employment of these workmen, it should hire them now in cases of manpower shortages, or if the company is experiencing a high employe turnover, or company expansion.

The establishment of minimum qualifications for the employment of older workmen is your simplest method of hiring those selected. Their qualifications can be quickly evaluated by a well-constructed employment form showing past employment history, special abilities and other items of interest to your company.

It is doubtful that employers engaged in earth and non-metallic handling material can employ a large percentage of women production workers, but older men workers can meet your production demands more efficiently. The problem, of course, is usually best settled by a straightforward approach. There is a need for an evaluation of the older workman in terms of the objectives sought in him. You may find many of your answers below.

- What is the quality of your present workers?
- Are our workers as good as they can and should be?
- How is the morale of our employes?
- Is our selection/placement program flexible?
- Does an older worker possess self-confidence?
- Will he do a full day's work?
- Does this older worker have any limitations?
- Is he promising for the future?
- Is he mentally and physically alert?
- Does he have self-control?
- Will he cooperate with his superiors?
- Does he use good judgement?
- Will he help keep costs to a minimum?
- Does he meet all employment standards?
- Is he good management material?

Any lasting cure for the shortages of skilled workers in this industry must, of course, take time. But greater utilization of older workers, in the interim, alleviate the problem to a large extent. Many employers are having success in utilizing older workmen. When an opening occurs in your factory, try to use an older worker. **END**



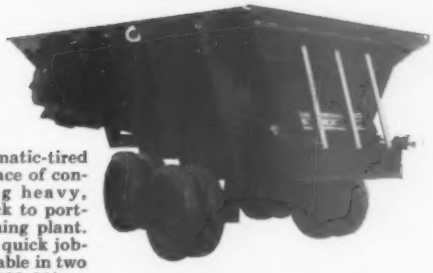
WORLD'S BIGGEST
The Pioneer ORO Feeder shown here is believed to be the largest apron feeder ever built. It is over 60 ft. long and 6 ft. wide. It contains 97,000 lbs. of manganese steel. Total weight: more than 185,000 lbs.

For men who like to underbid their competitors... *(and make a nice profit, too)*

Pioneer® Feeders

APRON FEEDERS

Heavy duty PIONEER Apron Feeders have ½"-thick overlapping forged steel pans carried on heavy chains which in turn are supported on wide heavy-duty idlers. Available with or without straight or flared sideboards as well as receiving hopper. Upturned, interlocking flanges at ends of pans help make Feeder practically leak-proof and spill-proof. Available in widths of 30", 36", 42", and 48"; lengths of 4', 6', 8', 10', 12', and more.



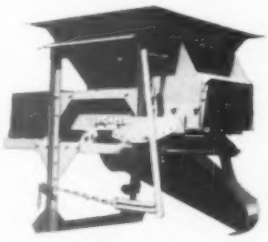
PORTABLE APRON FEEDERS

Mounted on pneumatic-tired chassis. Used in place of conveyor for feeding heavy, sharp, abrasive rock to portable primary crushing plant. Easily detached for quick job-to-job moves. Available in two sizes: 36"x30' and 42"x30'.

ORO FEEDERS

(See illustration at top of page) The most rugged Feeder made. Pans, rollers, drive sprockets, and tail idlers are all cast from special high manganese content alloyed steel. Pans are from 9/16" to 1" or more thick, depending on width of Feeder. Chain links are cast as part of pan so there are no bolts or rivets to break or loosen. Available in 30", 36", 42", 48", 60", 72", and 84" widths.

Free Handbook



MECHANICAL FEEDERS

PIONEER Reciprocating Plate Feeders are particularly well adapted to feeding gravel. May be used with shovel, dragline, clam-shell, or dozer to provide uniform flow of material to conveyors. Four different speeds built in. May be equipped with grate-bar grizzly, extended hopper, extension legs, or with wheels for greater portability. Models for every application.

For your free copy of *Facts And Figures* (the most complete and comprehensive handbook for the aggregates-producing industry), write to PIONEER ENGINEERING, Minneapolis 14, Minnesota, or contact your Pioneer Distributor . . . *today!*

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DIVISION OF POOR & COMPANY, INC.

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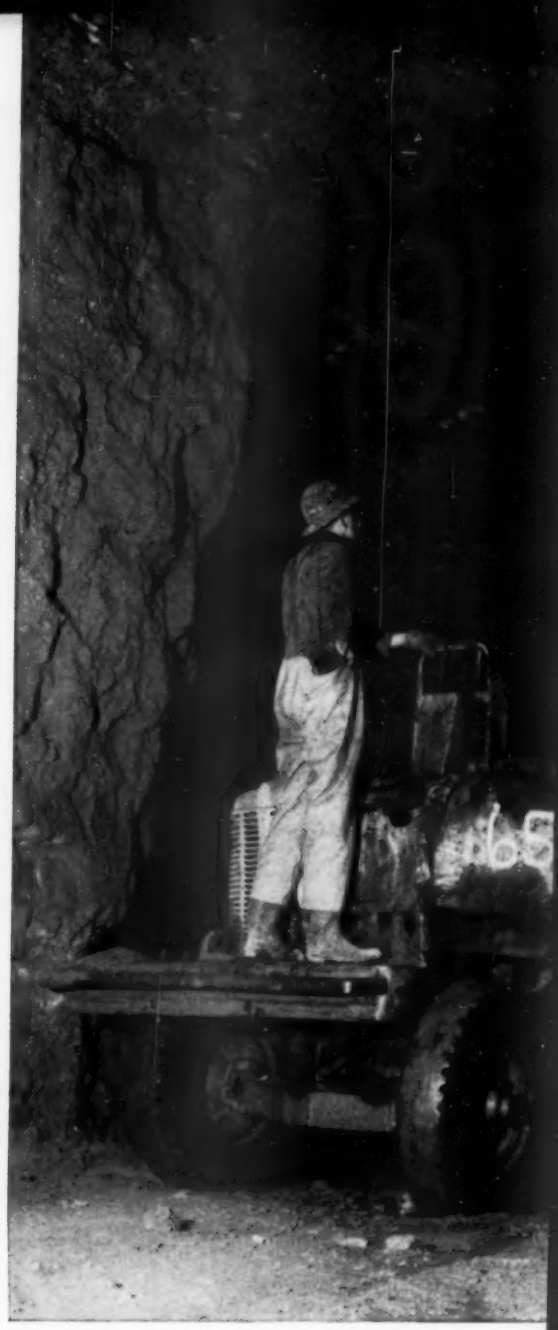
Average load of 8 tons takes a Michigan 2 to 4 minutes. Rock here averages 3% zinc (crushed and concentrated for shipment to smelting plants), 3% iron, 94% limestone (crushed and sold to railroads and contractors).



Tires replace tracks for underground zinc-ore loading at Eagle-Picher mine

Production boosted 40%, repairs cut in half

In the sprawling, honeycombed caverns of a zinc mine 300 feet below ground, two rubber-tired Michigan Tractor Shovels are loading out 40% more ore than the crawler loaders they replaced—proving mobility is an asset anywhere—even below the earth's surface.

Before the rubber-tired Model 175A Michigans were put to work in this mine near Galena, Illinois (one on the day shift; the other, at night), owner Eagle-Picher Company was using crawler loaders. Two things caused the switch to rubber. One, repairs on each crawler cost more than half *each year* of the total price of the crawler new. Two, lack of loader mobility was wasting time for all dependent equipment.

Since everything that goes in or out of the mine must travel through either of two mine shafts, it costs Eagle-Picher $500 or so just to lower, reassemble, and try out a new machine. But in this case, the company made up their "investment" in just a couple of shifts.

Save 60 minutes travel time

According to mine superintendent, Ed Houy—an 11-year veteran with Eagle-Picher—"First of all, an hour of waste time was eliminated every day. It used to take the crawlers 20 minutes to creep a mile or so from our central service area to the work site. And 20 minutes at the end of the day to come back again. The Michigans make the trip, either way, in five minutes. So 15 minutes a trip, 30 minutes total, are saved on each of our two shifts.

Triple output on scattered loading

"Mobility also pays off in certain areas of the mine where our 8-ton trucks can't be spotted right next to the shot rock," Mr. Houy continues. "Here, loaders must carry material as much as 100 ft. The rubber-shod machines often do three times the work of crawlers in these applications. The same advantage holds true when loads must be taken in succession from different headings in order to get the desired 3% blend of zinc for processing."

One Michigan keeps 5 trucks busy

Michigan output is high on straight loading too, according to general superintendent Harold Haman. "With trucks on average one-way haul distance to the crusher of about one mile," he says, "one Michigan loads out as much as 100 tons per hour. It alone keeps five 8-ton trucks busy. Each 8 ton load takes a Michigan three passes, two to four minutes (depending upon the digging and terrain). A typical day yields 1,400 tons of rock. Previously, with crawler loading, our top output was 1,000 tons. The daily increase, 40%."

Maintenance costs 50% lower

According to Robert Haffner, manager of Eagle-Picher's Illinois-Wisconsin operations, "Michigans not only load out more rock than the crawlers, but they also have proved cheaper to operate and maintain. Cost of maintenance per ton loaded *is about half.* Majority of the few repair jobs we've had have taken less than four hours to complete. And the shot rock, so rough that steel tracks and track frames required numerous overhauls, have been comparatively easy on tires. Recapping is needed only every 1,000 hours or so.

Ownership of 4 Michigans proves satisfaction

"Before Eagle-Picher settled on Michigans, we tried other machines," continues Mr. Haffner. "After careful consideration, we decided Michigans had the sturdiness, mobility, and productive capacity we needed. We now do all loading here in Galena—and at our Wis. mine—with Michigans. Four of them. So you can see how much we like them!"

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK® EQUIPMENT

2481 Pipestone Road
Benton Harbor 7, Michigan

In Canada:
Canadian Clark, Ltd.
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Michigan Dozer operator has excellent view of blade.

High-speed Michigan Dozer expands

Nevada firm reduces handling costs 25%

Nacon Company, Inc is a Las Vegas firm that *doesn't* take chances when buying equipment. "Gambling belongs in the casinos!" says Tom Stewart, president of Nacon. "Before *we* lay out $50,000 or so for any big dozer, we *demand* on-the-job demonstrations.

"Our latest demonstration really proved profitable. In the hopes of boosting crusher-feed production, we tried a rubber-tired Michigan Dozer. The output of this rig really surprised us. Tests showed the 375 hp Model 380 could push enough material to our crusher to produce 400 tons of spec stone per hour—*even at distances up to 400 feet.* No competitively-priced rig came close to this production. We talked it over with our Michigan Distributor, Graid Equipment Company . . . and bought!"

The Michigan's first job was on a 9-mile excavating-grading-structures section of new four-lane blacktop Federal Interstate Highway near Las Vegas. Here, Nacon's contract called for several hundred thousand tons of roadway base and sub-base gravel (3,250 lb/yd) in three grades—select bankrun, #1 and #2 stone. Michigan's share was to dig out and push all this material to the crusher. It did . . . at an *average* work speed of 3 to 7 mph!

Production up 20 to 30%

Output averaged 400 tons per hour . . . 20 to 30% higher than Nacon's estimates with other machines . . . at a per-ton cost "about 25% lower." And since the high-speed Michigan could economically work longer distances, Nacon didn't have to move the crusher as often as with crawler-feeding. One set-up handles as much as 315,000 tons.

Bud Jacobsen, operator of the Model 380, likes the Michigan for more reasons than high production. "For one thing, it's easier riding," says Bud. "Tires absorb bumps and ruts so you can work faster on rough going. Second, you sit higher . . . have a better view of blade and of ledge and hopper edges. Third, Michigan handles easier . . . you change speeds and direction simply by moving little hydraulic levers *and without foot-clutching.* Its ease of handling, plus greater speed, adds up to *greater production than any crawler at any distance over 50 ft!*"

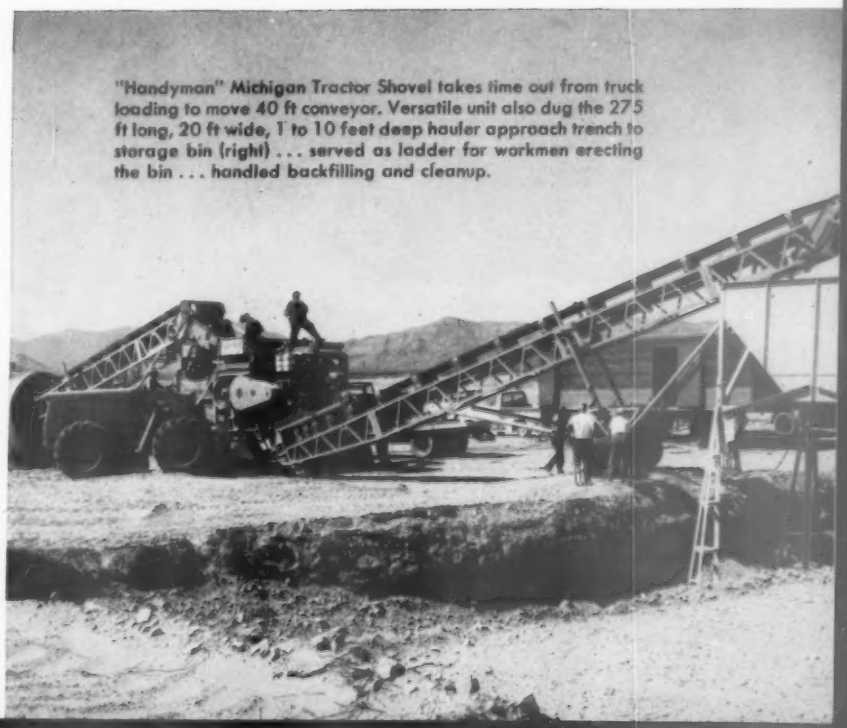
Michigan Tractor Shovel loads 20 yd trucks in 2½ minutes

But the Model 380 Dozer isn't the only Michigan drawing praise around Nacon's crushing set-up. A 2¾ yd Model 175A Tractor Shovel is attracting attention as

practical crusher feed distance to 400′

it handles stockpile loading. This unit heaps a typical 20 ton truck in only 5 passes, 2½ minutes . . . a typical 20 ton bottom-dump hauler in 4 passes, 2 minutes.

Output like this, day in and day out, speaks well of Nacon's job planning . . . also proves Michigans have what it takes to speed dozing and loading. See for yourself! Pick the rubber-tired Michigan Dozer you want to see, 162, 262, 375, or 600 hp . . . or the Michigan Tractor Shovel, 16 cubic feet to 6 cubic yards (standard SAE-rated capacity) . . . then ask your Michigan Distributor for a demonstration.



"Handyman" Michigan Tractor Shovel takes time out from truck loading to move 40 ft conveyor. Versatile unit also dug the 275 ft long, 20 ft wide, 1 to 10 feet deep hauler approach trench to storage bin (right) . . . served as ladder for workmen erecting the bin . . . handled backfilling and cleanup.

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RADIOACTIVE RAYS CONTROL CLINKER DEPTH

by D. H. Gieskieng*

THE TREMENDOUS POWER of gamma ray emission from radioactive materials has been harnessed to make an outstanding tool for the cement industry. The gamma-ray gauge, bed-depth control marks a significant advance in the automation of shaking-type clinker coolers. Its purpose is twofold: To guard the cooler against sudden overloading and to maintain operation near maximum stable bed depth.

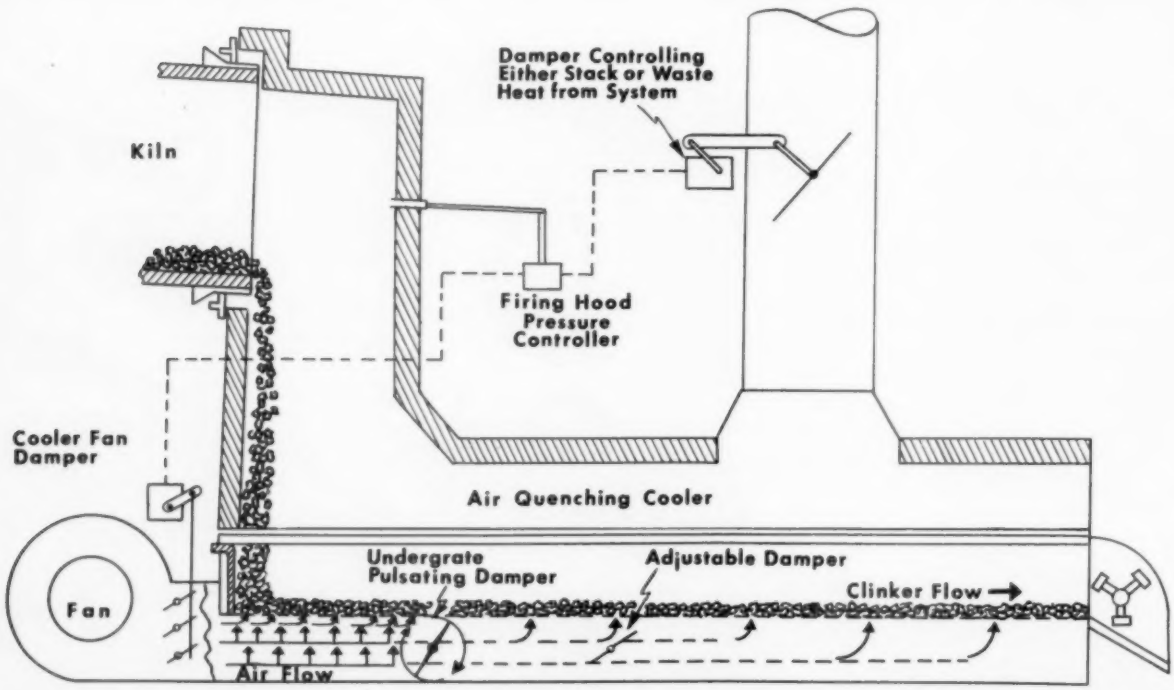
Processing Machinery Dept., Allis-Chalmers Mfg. Co.

Advantages to both clinker and kiln are assessed in operational stability and maintenance reduction. Grate temperatures are reduced and equalized, a "dead bed" is provided to cushion fall of clinker on the grates, and cooler speed is kept at a practical minimum. In addition, the controller will ride out and help to stabilize practically all kiln upsets.

Even though most shaking-type units are being

Please turn to page 154

FIGURE 1. A shaking-type clinker cooler, with its pulsating and adjustable dampers, is ideally adapted to the application of a nuclear bed-depth control



Enter 1080 on Reader Card

B.F.Goodrich

Copter hop over the new Niagara

Ride in the Bell Ranger and see how B.F.Goodrich tires help build the world's mightiest power project

SOON THE CHURNING WATERS of the Niagara River will be generating more electrical power than ever—over two million kilowatts, enough to light a city the size of Chicago.

More electricity at lower cost is what we'll get from the $720-million Niagara Power Project, one of the biggest peace-time construction jobs in our history.

Already trucks and other earth-movers have shouldered their loads more than 800,000 times—enough trips to take them ten times around the world.

To cope with the challenges of this and other tasks, Merritt-Chapman & Scott Corporation, largest contractor on the project, uses B.F.Goodrich tires and other products.

NOW WE'RE AT 3,000 FEET. Below us is the entire Niagara Project. At the upper right are the Falls. At upper left, 2½ miles above the Falls, is the Intake Area. Here water will be diverted from the Niagara River into 2 giant covered conduits, each of which is as wide as a 4-lane highway and 5 times higher than the Holland Tunnel. These conduits take the water into the vast Storage Reservoir. From there it moves to the new Niagara Generating Plant, where it plummets down to drive 13 generators. Turn the page and learn how this mammoth job is progressing with the aid of B.F.Goodrich tires.

This B.F.Goodrich report continues ▶

SWOOPING DOWN we come over the conduit area that will carry water from the Niagara River to the new reservoir. Excavations for the 46′-wide covered conduits are 110′ x 50′. The trucks below us, hauling away rocks, are equipped with B.F.Goodrich tires. Altogether, more than 2100 B.F.Goodrich tires—on dump trucks, loaders, graders and other equipment—work 'round the clock, six days a week, rolling over rock-strewn Niagara excavation sites.

See how 2100 B.F.Goodrich tires

B.F.GOODRICH ROCK SERVICE TIRES have run up amazing service records at Niagara—over 5,000 hours in some cases! The new B.F.Goodrich Cut Protected tread compound is outstandingly successful at withstanding cutting and chipping from abrasive Niagara rock. Massive double-chevron Rock Service cleats give extra traction in forward or reverse. And because of the B.F.Goodrich Flex-Rite Nylon cord body, Rock Service tires are almost immune to heat blowouts and flex breaks. Result: you get more original-tread hours of service, more retreadable tires.

TO GIVE CONTRACTORS what they need *when* they need it, B.F.Goodrich built a warehouse near the Niagara project. A complete line of B.F.Goodrich tires is stored, ready for every emergency. At the B.F.Goodrich Tire Service Building on the job site, a crew of trained tire maintenance men works in shifts, 'round the clock.

IT'S AN EMERGENCY, and the B.F.Goodrich Tire Service Man is there. He's trained to handle any type tire on any type equipment. He has at his disposal all the latest power tools, such as hydraulic cranes, pneumatic wrenches, bead jacks. Background: 13 penstocks at Niagara Generating Plant will direct torrents of water into giant turbines. Penstocks are 462 feet long.

are helping men harness Niagara

From the beginning of work on the Niagara Power Project, B.F.Goodrich on-the-scene specialists have helped determine exactly the right B.F.Goodrich product for each particular job. In addition to Rock Service tires (now available in the new Cut Protected compound), B.F.Goodrich Rock Logger, Tractor Grader, All-Purpose, Mud-Snow and Power Express tires are at work.

B.F.Goodrich hose feeds air to machines drilling dynamite holes. B.F.Goodrich rain suits, gloves and footwear protect hundreds of construction workers.

B.F.Goodrich conveyor belts will carry materials for 1,300,000 cubic yards of concrete, total required for the entire generating plant. And helping to keep the whole project humming are special B.F.Goodrich maintenance and service facilities—all part of the new B.F.Goodrich Unified Contractor Program.

No matter what your off-the-road job, B.F.Goodrich is ready to serve you, and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. *The B.F.Goodrich Company, Akron 18, Ohio.*

SPECIFY B.F.Goodrich Tubeless or tube-type tires when ordering new equipment.

B.F.Goodrich *off-the-road tires*

RADIOACTIVE RAYS CONTROL CLINKER DEPTH

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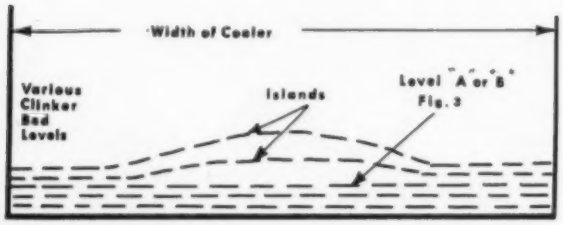


FIGURE 2. An island of hot clinker in the middle of the cooler resists the penetration of cooling air

used on cement clinker service, the principles involved may have interest throughout the rock products industry, both in the characteristics of the cooler and the means used for control. As a matter of fact, many of these factors apply to other types of cooler.

The need for control stems from variations in kiln output. The kiln discharges clinker to the feed end of the cooler grates; air is blown up through the grates and clinker by the fan, cooling the clinker as it is conveyed the length of the machine by shaking action. Fig. 1 shows a typical system.

Because differences in quantity or characteristics of kiln output affect this conveying action, coolers have always been equipped with variable-speed drives. Some installations, having peculiarities of clinker formation or kiln operation, require more regulation than others. Earlier attempts to automate this speed adjustment—undergrate air pressure, temperatures, air flow rates and others—were not generally successful. The need was met by this more basic approach, the gamma-ray level gauge principle to sense the actual depth of material in the clinker cooler.

Temperature stability has an important bearing on bed depth. Compatibility of the kiln-cooler combination is directly affected by secondary air temperature stability. Furthermore, fuel economy is tied more than proportionately to the temperature of the secondary air. The cooler, therefore, should be operated under conditions that provide maximum stable secondary air temperature.

Depending upon the clinker, whose characteristics are affected by mix and temperature, the action of the shaking grate and cooling air blast promotes uniform distribution of the material—up to a certain depth. As this depth is reached, the distributive forces are insufficient and the clinker, concentrated by kiln discharge, may remain deeper in the center of the grates than at the sides. This forms an "island," as shown in Fig. 2.

This island has greater density in the middle and relatively high permeability at the sides. The side areas are quickly cooled, allowing secondary air temperature to drop off sharply while the island remains hot and consolidated.

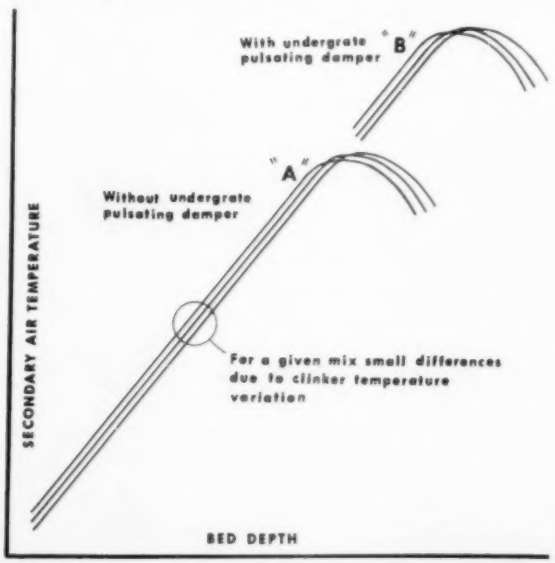
Maximum stable secondary air temperatures will be obtained with bed depths slightly below the depth, permitting the formation of an island.

The effect of bed depth on secondary air temperature is shown in Fig. 3. As the depth is increased, secondary air temperature increases—up to a point corresponding to the formation of an island. The actual break-off of the depth-temperature at point A is influenced by temperature and mix characteristics. The hotter the clinker, the stickier, and the more the tendency to resist distribution and form islands.

Maximum stable secondary air temperatures will be obtained with bed depths slightly below the depth permitting the formation of an island.

Deeper stable beds may be carried by the use of a pulsating damper and operation at point B becomes practical. The most effective pulsating damper to date is the one located in the windbox of the cooler, where a basic air pressure is maintained to the feed end grates, and sharp back pres-

FIGURE 3. Hot clinker can be carried in a deeper bed on the shaking cooler when pulsating dampers are used


With undergrate pulsating damper "B"
"A"
Without undergrate pulsating damper
SECONDARY AIR TEMPERATURE
For a given mix small differences due to clinker temperature variation
BED DEPTH

sure waves from the rotating damper are superimposed on the basic pressure. This sharp pulse is very effective in promoting distribution and uniform permeability.

Stability must be maintained the full length of the cooler, too. The importance of avoiding islands, or promoting uniform permeability across the clinker bed, has a counterpart in the variance of depth along its length. Obviously, any automation of cooler speed should accurately follow variations of kiln output to equalize this effect. For example, if the kiln output is suddenly increased, as by discharge of a kiln ring, the cooler-speed control should follow this variation immediately. It must assist in preserving bed depth and uniform permeability along the length of the cooler.

The gamma-ray level gauge will do this if it is placed close to the feed end of the cooler. When properly adjusted, this control adequately follows normal variations of kiln output, due to clinker ring fall-out, etc., as they gradually develop.

Sudden changes of output caused by kiln-speed changes are more marked because the full effect is immediate. These may be anticipated by the operator who can change cooler speed at the same time that he changes kiln speed. Better yet, a simple tie may be arranged between kiln-speed control and cooler-speed control, so that changes due to kiln-speed variations are automatically compensated. A small cooler-speed rheostat might be connected mechanically to the kiln-speed control rheostat, derivative of kiln-speed tachometer voltage or current variation superimposed on bed depth controller.

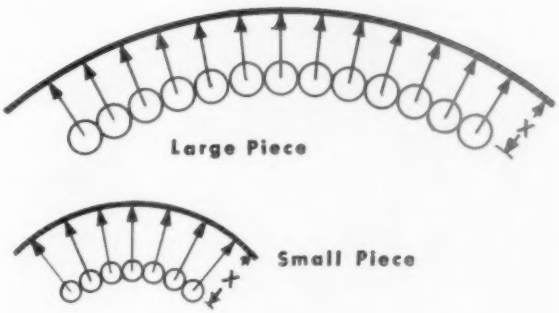
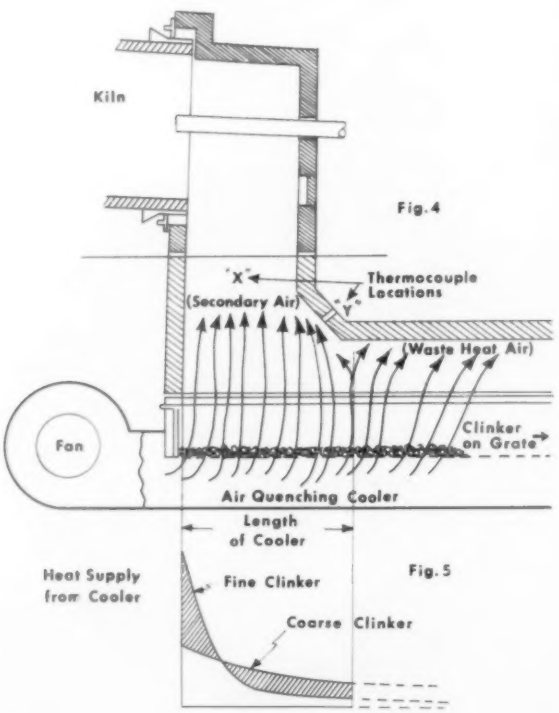


FIGURE 6. For a given depth X inside the clinker particles, large particles have more "heat reservoir"

FIGURES 4 & 5. Hot clinker gives up most of its heat to the secondary air in the first few feet of the cooler



Clinker size as it affects secondary air temperature is, perhaps, one of the most controversial aspects of bed depth control. The discussion usually refers to the surface areas of fine and coarse clinker, and the rule that heat exchange is proportional to surface area.

It is well known that bed depth control, coupled with secondary air flow control, results in remarkable stabilization of secondary air temperatures.

Secondary air is a composite of the air from the first 15 or 20 ft. of the cooler. This means that the clinker involved must apply heat to the cooling air for about 4 to 5 min. The diagrams in Fig. 4 and 5 show that the ability of the clinker to sustain this heat transfer must be considered.

The heat exchange calculation can become exceedingly complex, including consideration of the "heat reservoir" factors shown in Fig. 6. Simply stated, it means that if 1/10-in. clinker gives up its heat 10 times faster than 1-in. clinker, due to surface area per pound, it also will cool 10 times as fast and be comparatively impotent by the time it reaches the end of the secondary air zone.

Fig. 5, in composite with Fig. 4, illustrates heat

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RADIOACTIVE RAYS CONTROL CLINKER DEPTH

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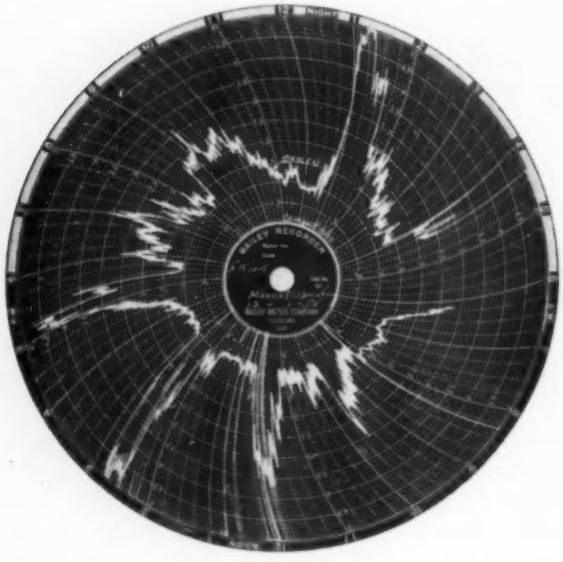


FIGURE 7. This is a typical oxygen analyzer curve with manual operation of cooler

release from fine and coarse clinker and excellent stability has been observed under extremes of size variation while the cooler was controlled at a stable bed depth, but this requires relatively constant discharge of clinker from the kiln, which is normal. In case of kiln cycling, the discharge rate changes. It may be seen that with constant bed depth the composite secondary air temperature will increase with increased kiln discharge, as the increased conveying rate will bring hotter clinker to the end of the secondary air supply zone. Since this secondary air temperature shift is in the proper direction to help "meet the load," and vice versa, it tends to stabilize burning zone conditions during cycling.

Secondary air temperature measurement is obtained by aspirating thermocouples. Fig. 5 shows that the location of an aspirating thermocouple in the throat of the cooler will influence its indications. While root-mean-square effect and others would be involved to obtain a true "average location," a practical position would appear to be midpoint on the side of the cooler throat, at X, Fig. 4.

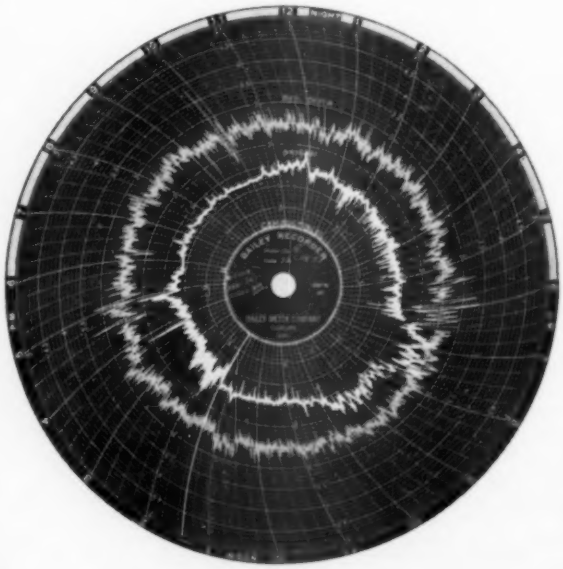
Remarkable stabilization of secondary air temperatures as measured by aspirating thermocouples has been obtained on coolers using a combination of bed-depth and cooler-fan control. Another demonstration of these stabilizing factors has been the record of kiln exit-gas oxygen. If other factors are constant (fuel supply and kiln-draft pressures) the pound mols of air going into the kiln will be nearly inversely proportional to the absolute secondary air temperature, primary air portion excepted. Changing the average secondary air temperature from 1,200 to 1,100 deg. F. (a 100 deg. change) would increase the mols of air some six percent. This would result in a change of exit-gas oxygen analysis of about one percent.

Fig. 7 is a typical oxygen-analysis chart before installation of the bed-depth controller, but with cooler-fan damper automation. Fig. 8 is the same chart after installation of bed-depth controller. Variations of less than .2 percent O_2 for long periods of time are noted. The composite secondary air temperature variation for these periods, as derived from exit-gas oxygen analysis, would accordingly be less than 20 deg. F., allowing for minute variations of firing rates, etc.

Aspirated secondary air temperatures during this test were within a 75-deg. F. band; however, the location of the thermocouple was at Y on Fig. 4, obviously not conducive to averaging the clinker size variation effect (Fig. 5).

As before, other factors have to be constant, such as firing rate and draft pressures, or the exit-oxygen-analysis temperature effect will be masked.

FIGURE 8. Automatic control of the clinker cooler suppresses the peaks and valleys of oxygen analysis



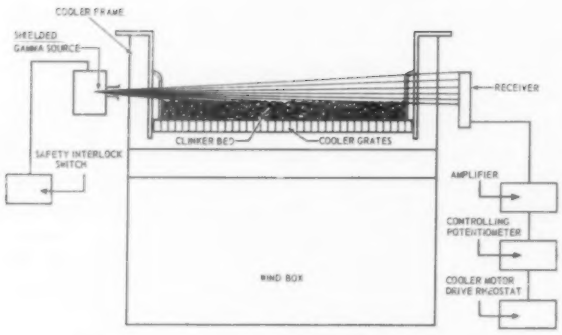


FIGURE 9. Cross-section thru length of oscillating cooler shows major components of the new control, radiation source and Geiger-Mueller receiver

Firing-hood pressure control is achieved by both cooler-fan and waste-air dampers. The cooler producing charts, Figs. 7 and 8, had a natural-draft, waste-air stack with fixed damper, and the firing-hood pressure was controlled by cooler-fan damper automation.

Cooler-fan damper automation has a greater stabilization effect than vent-stacked automation alone. This may be due to direct action on the controlled variable, or to the tendency to supply more undergrate pressure whenever decreased bed permeability requires it.

Over-all considerations indicate the need for simultaneous variation of both cooler-fan damper and waste-air damper to control firing-hood pressure. This means that the cooler-fan damper does not have to close as much to achieve a given amount of hood pressure control, yet much of the stabilizing effect of cooler-fan damper automation, just mentioned, is retained.

The tie between the cooler and vent dampers should be simultaneous and opposite, and provide adjustable proportional motion between the two, one damper having adjustably more or less action than the other. The relative levels or "bias" of the dampers should also be adjustable, so as to obtain an optimum combination between the two for any given installation.

For example, while a cooler-fan damper varies from 100-percent open to 60-percent open, the vent damper might simultaneously move from 50-percent to 70-percent open. In another installation, a better combination might be for the vent damper to vary from 70-percent to 100-percent open, for the same 100-percent to 60-percent cooler-fan damper motion.

Control of both dampers by a common instrument reduces hunting, and provides a smooth transition with changes in the permeability of the clinker bed. This means that more air (more than when vent-stack damper is preset and only the cooler-fan damper is varied) will be passed through the latter part of the cooler as coarser clinker is handled. More negative pressure above the end of the clinker bed will assist in cooling this naturally slower-cooling material.

The gamma-ray level gauge as a type of level detection has been known for about 10 years; but its first application to an air quenching cooler was in October 1958. Advantages stem from the fact that it can be located outside the cooler body and close to the feed end where it can provide an early signal. Since the inception of the gamma-gauge, considerable improvement in Geiger-Mueller tubes has been made, and the apparatus is practically maintenance-free.

The principle upon which the gauge functions

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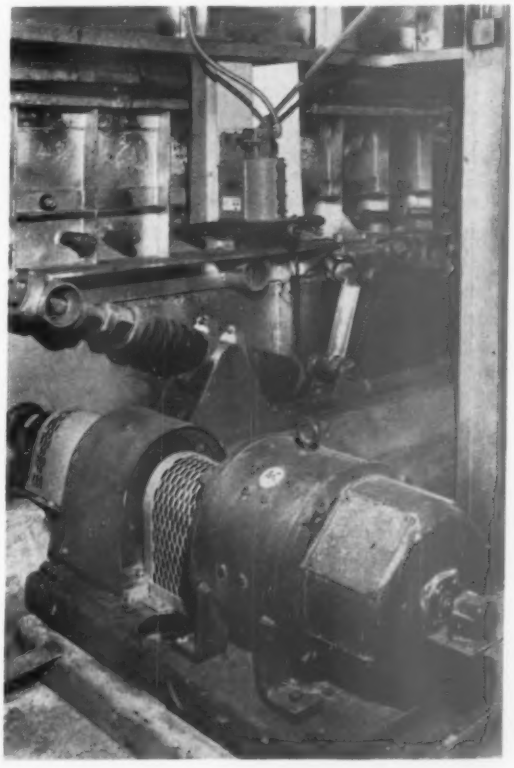
FIGURE 10. Gamma ray transmitting device for nuclear bed-depth control is installed on wall of air-quenching cooler. Motor in foreground drives the pulsating damper in the cooler's windbox



RADIOACTIVE RAYS CONTROL CLINKER DEPTH

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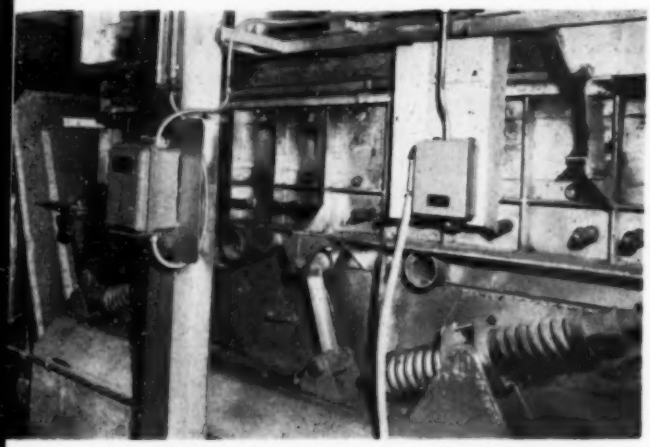


FIGURE 11. Receiver and amplifier of nuclear bed-depth control; receiver is installed close to the wall of air-quenching cooler

is illustrated in Fig. 9. A shielded source sends a stream of gamma rays through the cooler side plates, castings and liners. With the exception of the interfering effect of the clinker, they arrive at the far side weak but uniform. As the level of the clinker varies, it more or less "shades" the bottom portion of the Geiger-Mueller tubes. This decreases or increases the output from these tubes, which is amplified into a usable milli-voltage, and presented to a standard recording-controlling potentiometer.

The potentiometer control automatically adjusts the cooler speed to maintain a constant bed level. As the bed deepens, the cooler speed is gradually increased; conversely as the bed is reduced. Variations in clinker character or quantity are adjusted with the automatic "reset" feature of the control.

A gamma-ray source mounted next to a cooler is shown in Fig. 10. The source holder is interlocked, so that if the cooler motor is stopped, a light and horn alarm system goes into effect until the source holder is turned to "closed" position. If entry into the cooler is contemplated, the source holder is locked in "closed" position, as required by Atomic Energy Commission regulations.

This level gauge is a safe instrument. The radiation fields about the source holder and on the receiver side of the cooler are quite low and well within the acceptable limits set forth by the AEC. The higher field within the cooler is safeguarded by the supposition that no one will be inside the cooler while it is in operation, and the interlock alarm system will close the source if the cooler is stopped.

A receiver box containing the Geiger-Mueller tube is shown in Fig. 11 mounted adjacent to the cooler. The amplifier is attached to the column in the foreground. Fig. 12 shows the remote operating handle, with which the operator can close the source from the burner floor. The source holder can be touched with complete safety, but the remote shaft-handle is provided for convenience of operating it from the burning floor.

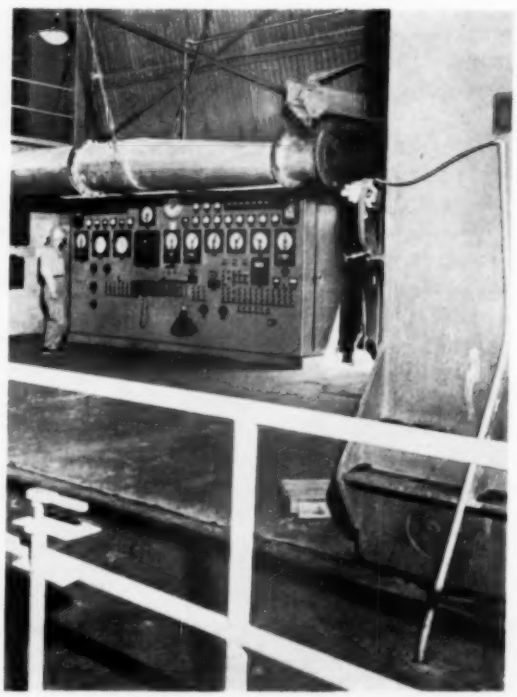
Neither the cooler parts nor clinker become radio-active as a result of using the gamma gauge.

Undergrate pressures previously were used to control these coolers. In general, most of the difficulty with this approach seems to relate to its inability to recognize variations of clinker size and the disruptions of permeability trend when operating near the break-off points A or B, Fig. 3.

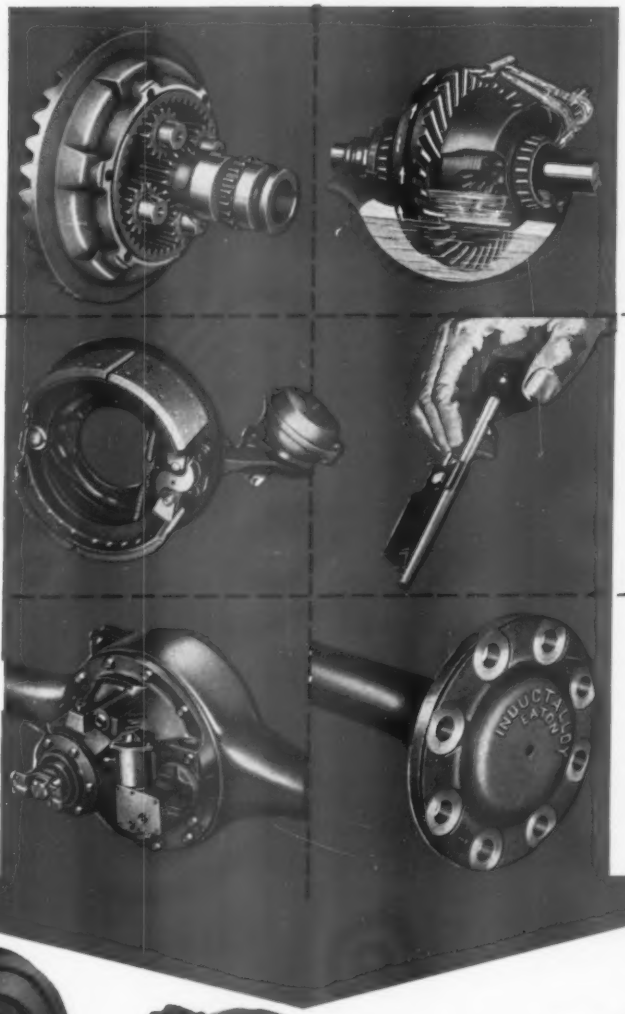
(A) Under certain conditions, usually excessive burning temperatures, it is possible for all of the clinker to become larger, eliminating the presence

Please turn to page 166

FIGURE 12. Burner floor in modern cement plant; handle in foreground controls the opening and closing of radioactive transmitter for the nuclear bed-depth control. This unit controls both speed and bed depth of air-quenching clinker cooler



Only Eaton 2-Speed Axles Have these Cost-Saving Features



PLANETARY GEARING

—distributes wear over four rugged, slow-moving planetary gears, resulting in lower unit stress, reduced maintenance, and longer axle life.

FORCED-FLOW LUBRICATION

—supplies positive lubrication to all moving axle parts, even at slowest vehicle speeds. Reduces wear; cuts repair bills.

SELF-CONTAINED AIR BRAKE

—makes quicker, safer stops. Simple design with fewer parts cuts relining time. Available on Eaton air brake models.

POWER SHIFT CONTROL

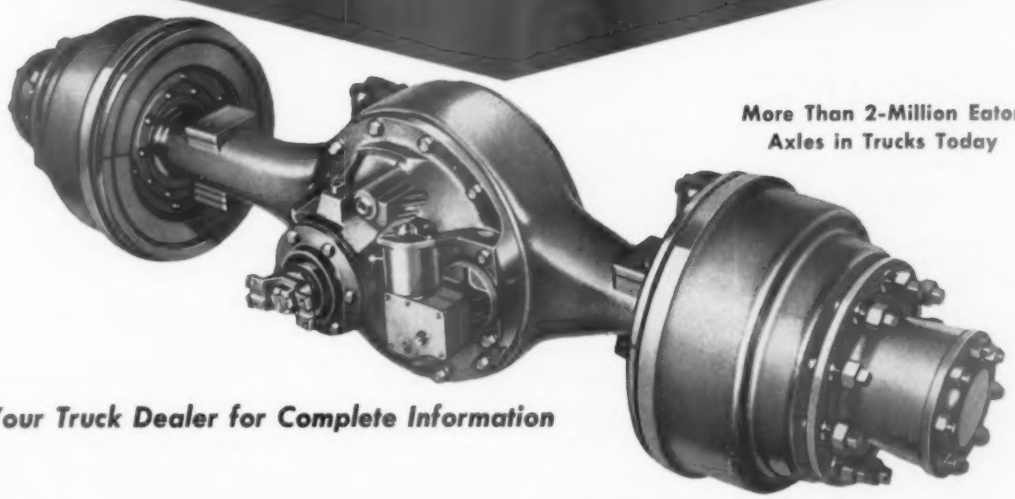
—provides quick, easy shifts. Drivers use right ratio for road and load; take full advantage of 2-Speed benefits.

EXTRA-RUGGED CONSTRUCTION

—of housing and all moving parts eliminates the possibility of harmful distortion or misalignment under full load; holds maintenance to a minimum.

INDUCTALLOY AXLE SHAFTS

—made of alloy steel, with Eaton's exclusive method of dual-hardening truck shafts; last up to 10-times longer; keep trucks on the road.



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Ask Your Truck Dealer for Complete Information

EATON

AXLE DIVISION

MANUFACTURING COMPANY

CLEVELAND, OHIO

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Tentative Program
44th Annual Convention
National Sand and Gravel Association
and
30th Annual Convention
National Ready Mixed Concrete Association
Conrad Hilton Hotel, Chicago, Ill.
February 15-19, 1960

Monday, February 15
Committee sessions all day

Tuesday, February 16, 9:30 a.m.

State and Area Association Conference

Presiding officer—H. G. Feraud

"Coordination of the Activities of State and Area Associations With Those of the National Associations," R. C. Shiely, vice president, J. L. Shiely Co., St. Paul, Minn.
"Cooperation with State Highway Departments on Common Problems of the Aggregate Producer," Ralph E. Simpson, engineer-director, Indiana Mineral Aggregates Association
"Collective Bargaining with Unions on a State-wide Basis," Clifford R. Oviatt, Jr., Connecticut Ready Mixed Concrete Association
"The Ready Mixed Concrete Industry in Montana Organizes for Group Action," W. A. Carson, director, Montana Ready Mixed Concrete Association
"From a Businessman's Point of View, What Are the Opportunities for Group Action by a State or Area Association?" James A. Nicholson, president, Nicholson Concrete Co., Toledo, Ohio

Tuesday, 2:30 p.m.

Session on NRMCA-NSGA Group Insurance Plan and Retirement Plan for Member Companies

Presiding officer—Charles E. Brady

"Advantages Derived By My Company from Participation in Group Insurance Plan and Retirement Plan," Henry H. Kirwin, treasurer, Eastern Rock Products Co., Utica, New York
"Arizona Aggregates Association Signs State-wide Agreement with Labor Unions Calling for NRMCA-NSGA Group Insurance Plan," James A. Murphy, president, Arizona Sand & Rock Co., Phoenix, Ariz.
Panel Discussion on Two Plans with Audience Participation Invited: Mr. Kirwin, Kenneth E. Tobin, Jr., group administrator, Mr. Murphy and D. E. Shepherd, consultant

Wednesday, February 17, 9:30 a.m.

Session 1, Simultaneous with Session 2

National Sand and Gravel Association

Presiding officer—E. Phil Gemmer

Address of the president, Mr. Gemmer
"Transportation—Our Industry's Number One Cost," Ellis E. Jensen, president, Janesville Sand and Gravel Co., Janesville, Wis.
"Does Land Reclamation Pay for the Sand and Gravel Producer?" Donald I. Battjes, secretary, Grand Rapids Gravel Co., Grand Rapids, Mich.
"Significance of Tests for Concrete Aggregates," Delmar L. Bloem, associate director of engineering
"What the Sand and Gravel Producer Should Know About the Percentage Depletion Allowance," John T. Sapienza, counsel for associations
Safety awards
Election of officers

Session 2, Simultaneous with Session 1

National Ready Mixed Concrete Association

Presiding officer—F. E. Schouweiler

Address of President Schouweiler
"Progress Report on Second Investigation of Uniformity of Strength Producing Properties of Portland Cement," Richard D. Gaynor, associate research engineer
"Tailoring a Public Relations Program for a Ready Mixed Concrete Company in a Small Community," Thomas F. Doyle, Galesburg Builders Supply Co., Galesburg, Ill.
"Words Often Speak Louder Than Actions," Andrew B. Meldrum, vice president, Meldrum and Fewsmith, Inc., Cleveland, Ohio
Presentation of Public Relations Performance Awards, Ralph H. Anderson, chairman committee on public relations
Presentation of safety awards
Election of officers

Wednesday, 2:30 p.m.

Session 3, No simultaneous session

National Sand and Gravel Association
National Ready Mixed Concrete Association

Presiding officer—Fred P. Curtis

"A Candid Look at the Highway Program," Bertram D. Tallamy, federal highway administrator
"How Does the Internal Revenue Service Operate — Some Observations," Dana Latham, commissioner of Internal Revenue
"Successful Management of a Growing Business," Dean James L. Hayes, School of Business Administration, Duquesne University, Pittsburgh, Pa.

Wednesday, 8:30-10 p.m.

Portland Cement Association presentation of films of interest

Thursday, February 18, 9:30 a.m.

Session 4, Simultaneous with Session 5

National Sand and Gravel Association
National Ready Mixed Concrete Association

Presiding officer—Henry H. Kirwin

Description of the Looseleaf Ring Binder on Fiscal Matters, Mr. Kir-

NSGA-NRMCA convention...

win, chairman, joint committee on fiscal policies

Report on Operating Cost Ratio Surveys for Ready Mixed Concrete and Sand and Gravel, Kenneth E. Tobin, Jr., assoc. executive secretary

"Congress Takes Another Look at the Internal Revenue Code," John T. Sapienza, counsel for associations

Panel on fiscal matters: S. James Campbell, Harry T. Campbell Sons' Corp., Towson, Md., Ward Anderson, Albuquerque Gravel Products Co., Albuquerque, N.M., James R. Spear, The Dolese Co., Oklahoma City, Okla., R. O. Evans, Concrete Supply Co., Charlotte, N.C., George C. Eady, Consumers Supply Co., Louisville, Ky.

Session 5, Simultaneous with Session 4

National Sand and Gravel Association

Presiding officer—Irving Warner, Jr.

"A Modern Dredge for the Mining and Processing of Sand and Gravel from Underwater Deposits," William L. Price, Dravo Corp., Pittsburgh, Pa.

"A One, Two Punch Beneficiation System—Combining Heavy Media and Elastic Fractionation," Robert F. Guise, Whittaker & Gooding Co., Ypsilanti, Mich.

"The Functioning of a Sand and Gravel Plant Designed for Uniform Grading Control," John S. Walker, engineer, Harry T. Campbell Sons' Corp., Towson, Md.

"A New Type of Dredge for Sand and Gravel Recovery," C. G. Cooley, president, Cooley Gravel Co., Denver, Colo.

Joint Luncheon, 12:30 p.m.

Presiding officer—F. E. Schouweiler, president, NRMCA

Address by the Honorable Carl T. Curtis, United States Senator from Nebraska

Thursday, February 18, 2:30 p.m.

Session 6, Simultaneous with Session 7

National Sand and Gravel Association
National Ready Mixed Concrete Association

Presiding officer—Quentin W. Best

"What the homebuilder expects from ready mixed concrete in the way of a quality product and quality service," W. H. Day, president, Jackson (Miss.) Ready-Mix Concrete

"Wider Employment of Ready Mixed Concrete in Highway and Street Paving," William F. Mengel, vice president, F. F. Mengel Co., Wisconsin Rapids, Wis.

"The use of promotion aids in development of wider employment of ready mixed concrete," George H. Tsuruoka, manager, Housing & Cement Products Bureau, Portland Cement Association, Chicago, Ill.

"Effective Scheduling and Dispatching Techniques," George R. Bathe, president, Ready Mixed Concrete Co., Omaha, Neb.

Session 7, Simultaneous with Session 6

National Ready Mixed Concrete Association

Presiding officer—Elbert F. Lewis

"Concrete Batching Equipment with Particular Reference to Automation," Kenneth P. Kerr, chairman, Concrete Plant Manufacturers Bureau, and vice president Butler Bin Co., Waukesha, Wis.

"Problems in the Operation of Truck Mixers," A. C. Thomas, assistant general sales manager, The Jaeger Machine Co., Columbus, Ohio

"A New Type of Central Mixing Plant," R. C. Shiely, vice president, Guaranteed Concrete Co., St. Paul, Minnesota

"The Functions of a Concrete Control Engineer," Harry Irwin, Warner Co., Philadelphia, Pa., Herbert C. Cullison, Harry T. Campbell Sons' Corp., Towson, Md.

"A Review of the Status of the ASTM Standard for Ready Mixed Concrete," Fred F. Bartel, chief engineer, Tews Lime and Cement Co., Milwaukee, Wis.

Friday, February 19, 9:30 p.m.

Session 8, Simultaneous with Session 9

National Sand and Gravel Association
National Ready Mixed Concrete Association

Presiding officer—Herbert G. Jahncke

"How Does the Griffin-Landrum Bill Affect the Operations of the Sand and Gravel and Ready Mixed Concrete Industry?" John J. Adams, Counsel for Cleveland Ready Mixed Concrete Producers in Area Bargaining, Cleveland, Ohio

"Where Does the Industry Stand in Relation to the Federal Wage and Hour Law, the Davis-Bacon Act and the Walsh-Healey Act?" Charles A. Horsky, counsel for associations

Panel discussion on above subjects: John J. Adams, Charles A. Horsky, Herbert G. Jahncke, Vincent P. Ahearn

"Washington Report," Mr. Ahearn

Session 9, Simultaneous with Session 8

National Sand and Gravel Association
National Ready Mixed Concrete Association

Presiding officer—E. J. Nunan

"Lightweight Concrete and the Ready Mixed Concrete Producer," John W. Roberts, president, Southern Lightweight Aggregates Corp., Richmond, Va.

"Prestressed Concrete and the Ready Mixed Concrete Producer," William J. Hicklin, Jr., vice president, Capitol Concrete Co., Jacksonville, Fla.

Review of Current and Projected Researches, Delmar L. Bloem, Associate Director of Engineering

Discussion of ACI "Recommended Practice for Measuring, Mixing and Placing Concrete" with particular reference to recommendations covering "finish screening," Stanton Walker and E. L. Howard, chief testing engineer, Pacific Cement & Aggregates, Inc., San Francisco, California.

Here's what you'll hear at the NCSA convention . . .

Tentative Schedule of Events
43rd Annual Convention
National Crushed Stone Association
Conrad Hilton Hotel, Chicago, Ill.
February 22-24, 1960

Monday, February 22

Morning

W. C. Rowe, president, National Crushed Stone Association, and president, Rowe Contracting Co., Malden, Mass.
Presiding

9:30—Moving picture
10:00—Greetings from the president
10:10—NCSA staff reports
10:50—Premiere showing of new NCSA film — "Graded Aggregate Base Course Construction"
11:20—"Cave Man to Space Man" by J. Lewis Powell, Alexandria, Va.
12:00—Adjournment
12:30—Greeting luncheon

O. E. Benson, president, General Crushed Stone Co., Easton, Pa.,
Presiding

Introduction of new officers and executive committee
Presentation of NCSA Safety Contest Awards, H. H. Kirwin, chairman, NCSA Accident Prevention Committee, and treasurer, Eastern Rock Products Co., Utica, N.Y.
"What's The Use?" Paul Jones, Director of Public Information, National Safety Council, Chicago, Ill.

Afternoon

2:30-5:00—Inspection of Manufacturers Division Exposition

Evening

6:00-7:00—Cocktail hour

Tuesday, February 23

Morning

Operating men and equipment manufacturers

Montagu Hankin, Jr., executive vice president, Houdaille Construction Materials, Inc., Division of Houdaille Industries, Inc., Morristown, N.J.
Presiding

8:30—"Growing Pains," Sound color moving picture through courtesy of the Portland Cement Association, Chicago, Ill.
9:00—"Latest in Plant Design for Large Volume Production," Don Wendling, vice president-sales, Vulcan Materials Co., Chicago, Ill.
9:20—Discussion
9:30—"Primary Quarry Drilling," W. Julian Parton, vice president-operations, General Crushed Stone Co., Easton, Pa.
9:50—Discussion
10:00—Coffee Break
10:15—"Building Up Concaves of Gyratory Crushers With Preformed Steel," A. J. DeMarchi, superintendent, Canada Crushed and Cut Stone Ltd., Hamilton, Ontario
10:35—Discussion
10:45—"In Plant Storage"—Panel Discussion. Discussion Leaders: R. T. Lassiter, New York district manager, Western-Knapp Engineering Co., New York, N.Y., L. E. Heidenreich, Jr., consulting engineer, Heidenreich, E. Lee, Jr., Newburgh, N.Y., and R. C. Meissner, vice president, Meissner Engineers, Inc., Chicago, Ill.
11:30—Adjournment

12:00-2:30—Luncheon for executives

John F. Lane, Gall, Lane and Howe, Washington, D.C., General Counsel, National Crushed Stone Association
Presiding

Discussion of federal laws and legislation of significant interest to crushed stone producers

12:30-2:00—Manufacturers Division Luncheon (For Members of the Manufacturers Division Only)

Afternoon

3:00—Bureau of Mines program for the investigation of damage caused by ground and air borne vibrations from quarry blasting, Dr. Leonard Obert, Chief, Applied Physics Laboratory, U. S. Bureau of Mines, Region V, Eastern Experiment Station, College Park, Md.
3:20—Discussion
3:30—"Visual Perception" — Sound color moving picture
4:00—"Control of Air Blast Effect Resulting from Blasting Operations," J. R. Kringel, vice president —production, New York Trap Rock Corp., West Nyack, N.Y.
4:20—Discussion
4:30—"Politics Is Your Business"—Speaker to be announced
5:00—Adjournment

Wednesday, February 24

Morning

9:00-12:00—Inspection of Manufacturers Division Exposition
12:30—General luncheon

George D. Lott, Jr., president, Palmetto Quarries Co., Columbia, S.C.
Presiding

"Shall We Survive?" Dr. Nicholas Nyaradi, Director, Institute of International Studies, and former Minister of Finance in the Hungarian Cabinet

Afternoon

2:30—"Modern Ballasting Practices," J. P. Datesman, process engineer, Chicago & North Western Railway Co., Chicago, Ill.
3:00—"Highways and the National Economy" Ellis Armstrong, Commissioner, Bureau of Public Roads, Washington, D.C.
3:30—"Evaluating Quality Requirements for Aggregates," F. V. Reagel, engineer of materials, Missouri State Highway Commission, Jefferson City, Mo.
4:00—"Nothing is Wrong With Me —Everyone Else is Crazy," Dr. B. G. Gross, Chicago, Ill., executive secretary, Northtown Industrial Management Club

Evening

6:00-11:00—Dinner, entertainment, dancing

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WORLD'S EASIEST HANDLING CRAWLER

62 gross engine h.p. with 1-yd. loader

Take the controls of a new Oliver Trans-O-Matic OC-96 Loader —and "let the tractor do the talking!"

Power shifting plus power steering (with three types of turns) makes the startling difference! The OC-96 is *so easy* to operate, it simply cannot be compared with older designs on this count—*or any other!*

You sit in a spacious, foam-rubber seat (offset for ideal visibility)...have full-freedom leg room in the wide, flush-deck compartment.

As for the controls, they're practically "in your lap." Levers for *power* steering, *power* reverse and *power* shift are placed directly ahead of the seat. Your arms are in "resting" position all the time. To brake or foot-steer, pedals do the job just as effortlessly.

Easy operation, indeed! The *easiest* you ever had—plus.

NEW! 3 types of power turns—The only crawler its size giving you counter-rotation turns for about-faces in the tractor's own length—also spot turns and gradual turns.

NEW! Power shifting—Shift from forward to reverse instantly, on the go. No clutching, no gear-clashing with Oliver's all-hydraulic Trans-O-Matic transmission. Four speeds in high or low range—forward to 6.05 m.p.h., backward to 8.07 m.p.h.

NEW! Torque converter—The OC-96 has heaviest-duty torque converter (not automotive kind)—delivering full engine power for digging and crowding in fastest non-stalling operation. Advanced 62 gross h.p. diesel.

NEW 1-yd. loader design—See how the OC-96 is an *integral* tractor-loader minus high, hung-on parts and cross members. Loader side pedestals are actually part of the tractor for low profile, high stability, finest visibility and safety. Fast breakout, greatest dumping reach. No other its size has such rapid work cycle—is so rapid-reversing.

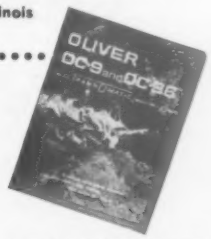
LOOK TO OLIVER FOR YOUR BEST BUY IN WHEEL AND CRAWLER TRACTORS

THE OLIVER CORPORATION

Dept. 2232, 400 W. Madison St., Chicago 6, Illinois

"I save 12¢ per ton with my OC-96," says Mr. John Zanella, owner-operator of Zanella Brothers, Mt. Carmel, Pa. "Not only that, it does the work in the same amount of time it used to take with our former machine with a 1½-yd. bucket."

More and more owners and operators are finding out the same thing—with the OC-96 loader they can get more work done for less money...easier and faster than ever before. No matter what your loader operations, why not find out for yourself how you can benefit from the OC-96? Ask for a work test on your job, today!



NEW CATALOG—"must" reading for cost- and comfort-conscious tractor users.

Question 1:

What's <u>different</u> about Haulpak®?

ANSWER: The LW Haulpak is like other off-road trucks *only* because it has wheels and an engine! Otherwise, its design is completely different... for your benefit. For instance:

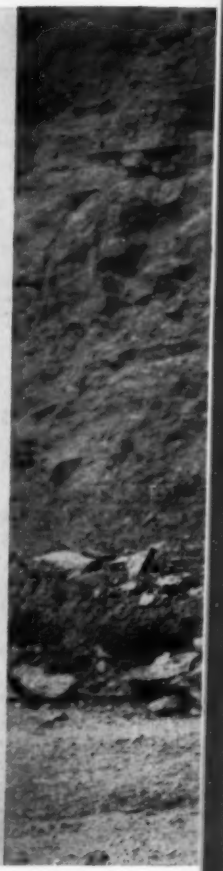
RIDES ON AIR — Other trucks ride on steel springs that need much attention. Haulpak eliminates this major cause of downtime with the exclusive LW HY-DRAIR* suspension system. With it, Haulpak *rides on air*... the load rides smooth and level on rough roads. You can safely use faster hauling speeds, move more tons per hour. Hydrair also makes possible many other advantages:

SHORTER TURN RADIUS — Because Hydrair suspension eliminates need for conventional springs and

Notice the deep "V" body which permits Haulpak to carry about 25% of its load *below* what would be the floor line of a conventional hauler. This gives greater stability, permits faster travel on turns and steep grades. ▶

Here's HYDRAIR

This sturdy, simple air-hydraulic suspension replaces the usual leaf springs found in conventional off-road equipment, relieving Haulpak owners from expensive spring repair and maintenance. Hydrair cushions against loading and travel shocks, compensates automatically for off-center loading, and keeps the load riding level over bumps and holes, for faster, more profitable hauling cycles.



Question 2:

How does Haulpak <u>save you</u> money?

ANSWER: From the answers above you can easily see how this all-new hauler *saves* on hauling costs, gives you:

- **greater maneuverability**
- **lower operating cost**
- **lower maintenance**
- **faster hauling**
- **more pay-tons per hour**
- **...and bigger profits**

front axles, Haulpak's front wheels can be turned at sharper angles . . . permits U-turns in 2/3rds the space required by competitive trucks. And without need for springs and axles, Haulpak can be built with a shorter wheelbase for more efficient transfer of power-to-wheels. There is, however, no loss in load capacity, because you get the LW exclusive . . .

DEEP "V" BODY — This permits carrying about 6 tons of material *below* the normal floor-line of conventional trucks. It also gives you a lower center of gravity, better stability on turns and steep grades.

HAULS THROUGH DEEP MUD — Haulpak is equipped with the famous LW power-transfer differential, used for many years in thousands of heavy-duty Tournapull® earthmovers all over the world. When one drive wheel begins to slip, power is transferred automatically to the wheel on firmest footing. Soft going does not stop Haulpak!

MANY OTHER MONEY-SAVERS! You save on fuel, because Haulpak is built of the newest lightweight high-tensile strength steels . . . to reduce deadweight and increase pay-load. Also, Haulpak gives you power-shift Torqmatic transmission, full power-steering, multiple-disc brakes with 5,148 sq in. total braking surface, double-acting hydraulic rams that lift body to 70° tilt in 16 seconds for fast dump. And lubrication check is reduced to only 3 easily-reached fittings needing attention only at 500-hr intervals. Haulpak is not just a "beefed-up" highway truck . . . it is a totally new concept developed to cut off-road hauling costs.

Next time you need an off-road hauler, investigate Haulpak. Now available in 3 sizes: 22, 27, and 32 tons capacity. Request literature, and ask to see our new color movie, "*Revolution on Wheels*".

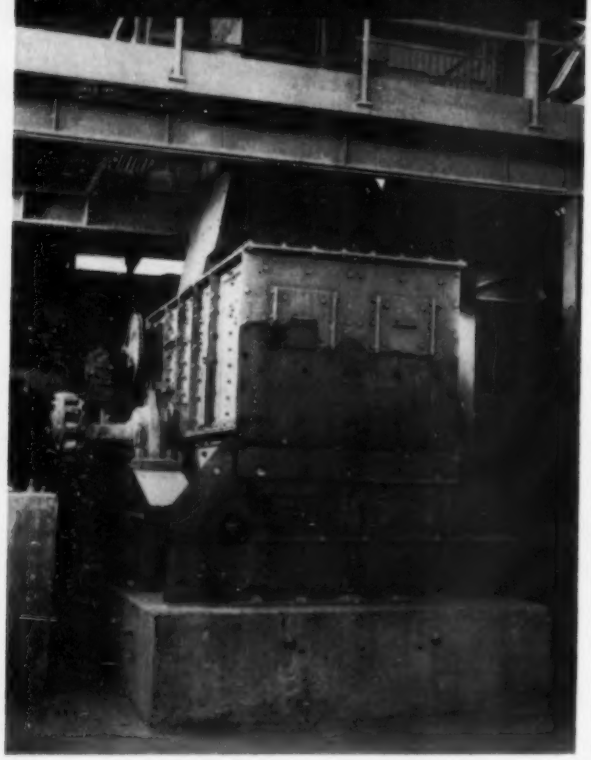
*Trademark HP-2261-G-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Another size reduction problem solved by Hammermills, Inc.



Bulldog Non-Clog Hammermill

Crushes 375 to 400 tons wet limestone per hour

Limestone fed to this primary Hammermill at a new Midwestern cement plant contains 12% silica. It is mixed with clay and is high in moisture. The Bulldog Non-Clog Hammermill crushes this material at a rate of 375 to 400 tons per hour with a power consumption of 600 h.p.

Bulldog Non-Clog Hammermills are known throughout the industry for their ability to handle tough jobs. They'll give more capacity per horsepower. They require less maintenance.

Hammermills, Inc. can help you lower costs and increase your capacity. For the names of the Hammermills representative in New York, Chicago, St. Louis, Toledo, Dallas, Denver, Los Angeles, and Melbourne, Fla., simply write us.

Manufacturers of Hammermills for primary and secondary crushing • Impactors • Jaw Crushers • Roll Crushers • Cone Crushers • Wobbler Feeders • Apron Feeders

HAMMERMILLS, INC.

Subsidiary of PETTIBONE Mulliken Corp.

625 C Avenue N. W., Cedar Rapids, Iowa

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RADIOACTIVE RAYS

continued from page 158

of fines. This results in extremely high bed permeability. Undergrate pressure controls have characteristically overloaded coolers during occasions of this kind.

(B) Fig. 5 indicates the desirability of maintaining constant bulk on the grates for average heat supply availability. Controlling to constant permeability, as by undergrate pressure, upsets this requirement. A fine clinker bed will be thinner and a coarse bed thicker, tending to aggravate kiln upset. Many undergrate-pressure controlled units have substantiated this by producing excellent undergrate-pressure charts but, at times, also simultaneously making poor secondary air temperature charts.

(C) As previously outlined, it is economically desirable to operate the cooler near the "maximum stable bed depth." Referring to Figs. 2 and 3, it is known that bed permeability can shift radically beyond points A or B, and that corresponding reflections of undergrate pressure would not necessarily correspond to stable control objectives. The more successful undergrate-pressure control installations do operate somewhat below maximum stable depth of bed.

Even with the more successful undergrate-pressure controllers, in practically every case of kiln upset it is necessary to go off automatic control and revert to manual control.

In spite of these shortcomings, the more successful undergrate-pressure controllers have assisted routine operation and reduced maintenance, as compared to manual operation.

The gamma-gauge, bed-depth controller will ride out and help stabilize practically all kiln upsets. The only exception is when the kiln goes substantially raw. Under these conditions, the raw material sifts through the grates and does not reach the sensing point. Control should then be turned to manual until clinkering is resumed.

Since this raw kiln condition is associated with low cooler speeds, a warning light should be arranged to tell the burner that the cooler speed is in the lower range. Then he can make every effort to avoid letting the kiln become or remain raw.

Automatic operation with cooler-fan damper and undergrate pulsating damper is highly desirable to achieve maximum performance with bed-depth control. Any of these alone will improve performance. But of these, bed-depth control is the most important. It constantly guards against overloading, as when a nose ring falls out between observations. It maintains operation near the maximum stable depth of bed, reducing and equalizing grate temperatures. It provides a dead bed to cushion

Please turn to page 170

WILLIAMS REVERSIBLE IMPACTOR

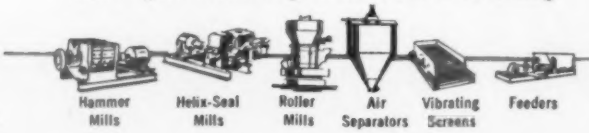
- 100% Impact Reduction
- No Friction Or Abrasion
- Unobstructed Discharge
- Less Upkeep Expense

Internal view showing manganese steel impact blocks, hammers and liners. Rugged, heavy steel plate construction. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.

Unequalled For Secondary Grinding

Reduces limestone and material of similar hardness to 1½", ¾" or smaller. Properly adjusted, the Williams Impactor makes excellent material with the proper percentage of fines for road base course. Unusually low upkeep expense as reduction is 100% by impact. Material is fed to enter between the hammers and is thrown against the impact blocks setting up a repeated ricochet action which accomplishes the reduction. Adjustable impact blocks adjust for wear. A reversing switch on motor permits rotating hammers in either direction, to the left today and to the right tomorrow, thereby giving double hammer life. No grates are used. Entire bottom is open permitting unobstructed discharge of crushed material and less wear and tear. A size for every job. Let us tell you about one for your use.

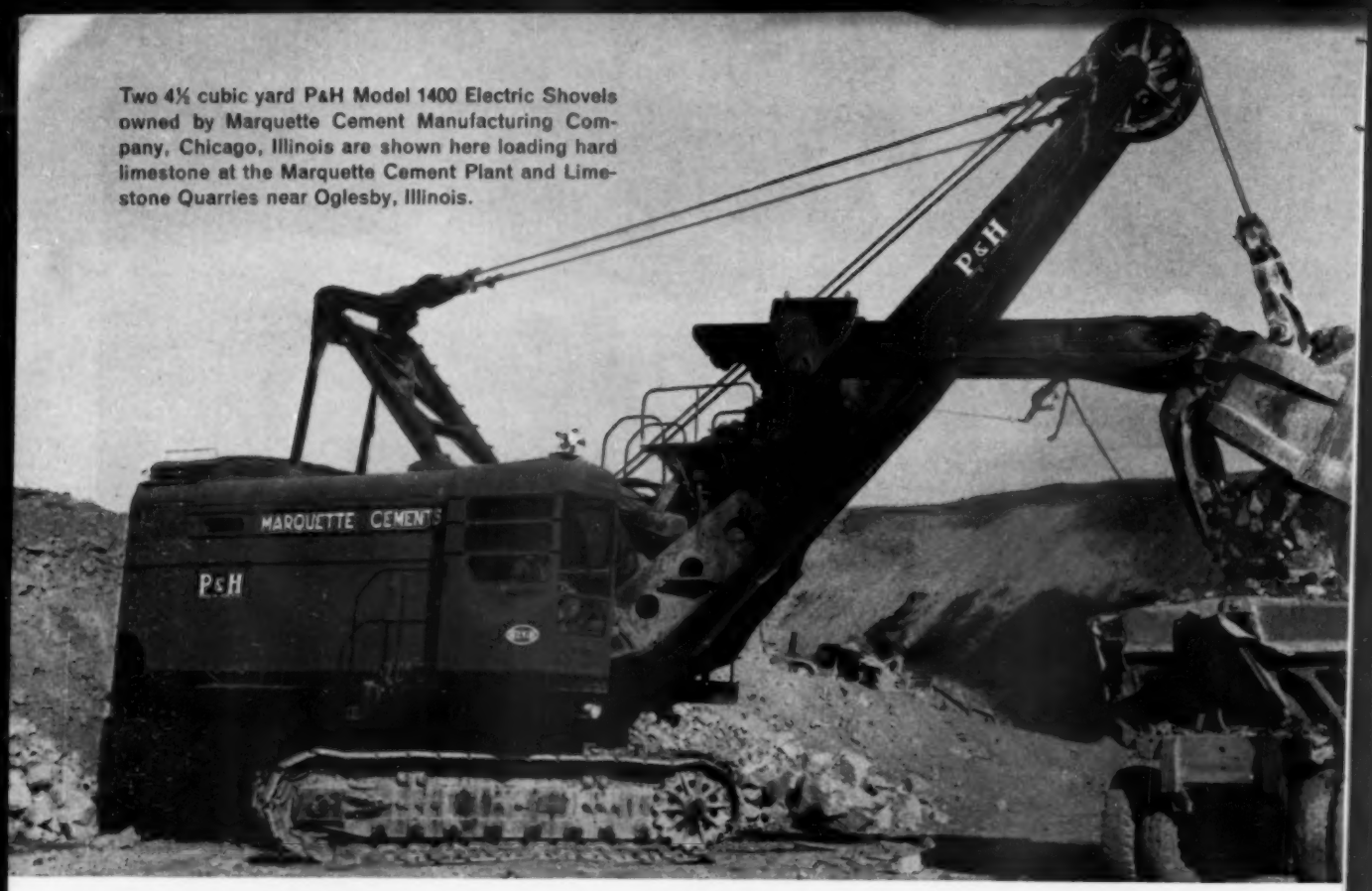
WILLIAMS PATENT CRUSHER & PULVERIZER CO.
800 ST. LOUIS AVE. St. Louis 6, Mo.



WILLIAMS
CRUSHERS GRINDERS SHREDDERS

Oldest and Largest Manufacturers of Hammer Mills in the World

Enter 1036 on Reader Card



Two 4½ cubic yard P&H Model 1400 Electric Shovels owned by Marquette Cement Manufacturing Company, Chicago, Illinois are shown here loading hard limestone at the Marquette Cement Plant and Limestone Quarries near Oglesby, Illinois.

One P&H always sells another...

At MARQUETTE CEMENT COMPANY P&H "Profit·Tons" reduce loading costs all day... every day

Up to 10% more production, lower loading cost per ton and more net profit are the reasons why mining operators the world over are standardizing on P&H Electric Shovels. Actual job reports from P&H owners indicate that up to 30% higher bail pull maintains a more uniform dipper speed for faster filling in difficult digging. Also, greater job availability and the exceptional physical strength of P&H welded alloy construction are responsible for this outstanding performance.

P&H "Profit-Tons" are the end product of these exclusive P&H design principles:

MAGNETORQUE® puts more material into the dipper—faster—with every pass! It's the most productive digging motion drive known for electric shovels. This patented P&H drive electro-magnetically transmits the full digging power of an A.C. hoist motor direct to the dipper without motor generator set conversion to D.C. current. It gives higher bail pull, greater dipper fill factor and automatic impact protection to the digging machinery.

ELECTRONIC CONTROL . . . this patented P&H control accomplishes the quickest work motion reaction time known on electric shovels. Control maintenance expense is reduced as much as 80% by elimination of all moving parts for a completely closed circuit system.

In addition, with P&H—and only with P&H—do you get the service assurance of single source responsibility. P&H manufactures their own electrical as well as mechanical components—designed specifically for electric shovel service. Write Dept. 500A, Construction & Mining Division, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

HARNISCHFEGER

Milwaukee 46, Wisconsin

P&H

P&H LINE:

Electric Excavators:	3½ through 10 yds.
Diesel Excavators:	½ through 3½ yds.
Truck Cranes:	10 through 80 tons

P&H equipment is also manufactured in Australia, Brazil, Canada, Germany and Japan.

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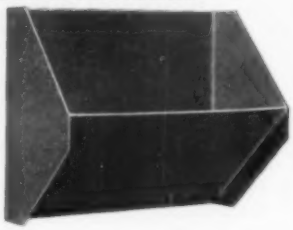
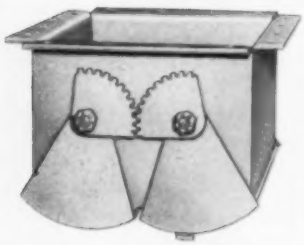
STANDARD METAL'S users lick TOUGH problems Every Day!

STANDARD METAL'S CONTINUOUS ELEVATOR BUCKET STYLE No. 2

This long-life bucket resists wear —delivers outstanding service and economy under severest conditions. This style is just one of the complete line of low-cost, rugged steel buckets manufactured by Standard Metal. Available in Salem, Style "A" and other continuous style buckets.



STANDARD METAL'S BIN GATES

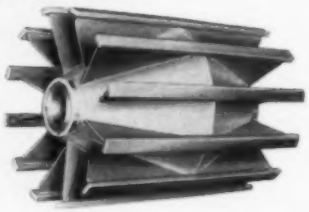


Here's the all-steel, gear-operated Duplex Bin Gate for faster, easier material handling at minimum cost. Now supplied standard with twin bracket at bottom of gate, drilled to accommodate bolt for fulcrum lever.

Single Bin Gates by Standard Metal also available.

STANDARD METAL'S WING-TYPE SELF-CLEANING PULLEY

Includes Taper-Lock Split Bushing to save time and trouble when mounting shaft. These pulleys are light in weight, yet their all-steel welded construction resists breaking, and delivers many years of trouble-free, low-cost service. Also available with solid hubs bored to specifications.



Contact us for full details and quotations on your particular needs in elevating and conveying equipment—for new installations or replacements. Ask for the catalog showing the complete Standard line.

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RADIOACTIVE RAYS

continued from page 166

fall of clinker on the grates and keeps cooler speed at lowest practical minimum. These ideal operating conditions have been achieved in practice and have resulted in substantially reduced operating costs. **END**

ROCK VS. RUBBER BATTLE

continued from page 138

pay the service cost if you have them fixed by experienced workers with top-grade materials and up-to-date equipment. It's a shortsighted policy to settle for temporary repairs or to run tires with injuries and worn treads to destruction.

No matter how large or small your operation may be, you can get speedy service on tire repairs. Plants with equipment capable of excellent work are located in many centers of activity in the rock industry. They have trucks to pick up and deliver your tires. In many locations, you can get dealer service for all tire changes on a fixed fee per hour. Your man then can be a supervisor who inspects and checks, but who calls on the tire supplier for the strong-back activity.

Unless your operation is a large one requiring tire changes and other service daily, it is less costly to hire the job done. A service truck with adequate equipment to handle tires weighing up to a ton requires an investment of more than $5,000.

In storing your spare tires, you should fully protect a sizable investment. Tires do not quickly show signs of deterioration from exposure and neglect when not in use. However, it is not expensive to obey the rules of good housekeeping that will keep them fit until they go onto the wheels.

If not kept under roof, spares should be shielded from bright sunlight. Canvas or heavy paper covers will do for this purpose. Dirt and water should be kept from getting into tires. Special care also must be taken to protect tire beads from gouges since, in these days of tubeless tires, a good tight fit of the beads is required to hold the pressure. Grease and oil will damage rubber if allowed to remain in contact, so sidewalls of spares, as well as tires on the wheels, should be kept clean.

During a long lay-up, vehicles should be lifted and blocked to take the weight from the tires. Otherwise, pressure should be kept at ¾ of working level. When on blocks, pressure may be reduced to 25 percent of normal. Tires on vehicles can be marked for changing between shifts or during fleet down-time when it won't interfere with production schedules.

Please turn to page 175

Put the EARNING POWER of a **UNIT** in your pit

This one does a man-sized job — has real muscle and speed to give you the power, capacity and output you require to make a profit from your pit operation. UNIT shovels and draglines are dependable producers, whether digging, loading, stockpiling, or dredging. Low original, operating and maintenance costs, *plus* reliable production, mean you *earn more* with a UNIT from each ton of material moved. ■ Here are some important reasons why UNIT is your most profitable choice for an efficient, cost saving excavator. ■ The exclusive, one-piece cast gear case (there's nothing else like it) keeps machinery in perfect alignment and seals out all dirt and moisture for virtually maintenance-free operation. ■ Straight-in-line mounting of the engine and main machinery contributes to the low operating cost by eliminating many wearing parts, reducing friction loss, and harnessing every bit of horsepower. A worm drive transmits the power smoothly — features an efficient, one-step reduction from engine speed to the main machinery. ■ Disc clutches wear evenly for longer life and their smoother operation reduces load shock on the entire power train. ■ Automatic traction brakes provide an instantaneous traction lock on steep grades . . . are quickly serviced because split brake drums allow linings to slide in or out without completely dismantling brake shoes or drums. ■ Your factory-trained UNIT dealer has full information on the complete line of UNIT ½-yd., ⅝-yd. and ¾-yd. excavators. Call him *now* for detailed specifications and price information.

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SHOVELS ½ to ¾ YDS. DRAGLINES ½ to ¾ YDS.

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UNION

The *UNIQUE Wire Rope Organization

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Customers can be credited for Union's outstanding position.

Why? Simply because in large numbers they accepted Union's standing invitation to share their wire rope and sling problems with Union's technical, research and engineering staff.

In meeting these challenges, Union has compiled an outstanding record in wire rope advancements. Some 1600 standard wire rope constructions are in day-to-day production under statistical quality controls which insure "the ultimate low cost rope." This means quality so good that it costs less in the long run.

In searching for better answers to wire rope and sling problems for customers, Union engineers developed the famous family of Tuffy wire ropes and slings.

Each member of the Tuffy family is of a special construction tailored to one of the tougher wire rope jobs. In the Tuffy constructions there is balance—the right combination of strength, flexibility and resistance to wear for better performance and greater safety. When you say Tuffy, you specify the "Ultimate low cost" wire rope or sling.

Tuffy® Wire Ropes and Slings

Tuffy Balanced Dragline Rope

Tuffy Balanced Scraper Rope

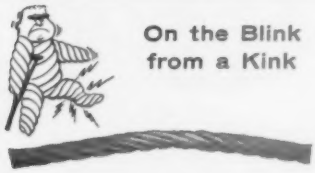
Tuffy Balanced Dozer Rope

Big Paul, The King of Spades, world's largest electric power shovel. In taking a 105 ton bite (2 rail carloads) it imposes a maximum bail pull upon the wire ropes of 550,000 lbs. One-half mile of wire rope is required in its operation by the Peabody Coal Company at its modern River King Mine, Freeburg, Ill.

Look Up Your Union Distributor In Phone Book Yellow Pages

He's selected for his ability and willingness to supply you with the right Union standard or Tuffy wire rope construction, to check for proper installation and coach your operators in proper use to get the ultimate in service life. He is backed up by a nearby Union branch office and warehouse. If you would like to receive Union's Rope Dope Educational Bulletin, write Union Wire Rope Corporation, 2156 Manchester Ave., Kansas City 26, Mo.

Tuffy Wire Rope Tips on Safe Use of Wire Rope and Slings



On the Blink from a Kink

Mishandling of rope caused this open kink. Avoid kinks by proper winding on the drum. Never pull a loop smaller. Enlarge it, then straighten out the rope.

Overloaded - Soon Exploded

The rated capacity of a wire rope is based on breaking strength divided by the load factor for particular type of service. Grade of steel, type of construction and size of rope determine tensile strength. Unless rope is properly related to loads, costly and dangerous early failures are likely to occur.

Mangled in a Wedge Socket

Here's a result of improper socketing, caused by poorly designed or worn-out wedge socket. Can be costly and hazardous!

Victim of the "Bends"

Excessive bending of rope speeds up wear. General rule: use more flexible ropes as bending stresses increase (with decrease in tread diameter of sheave or drum). If sheaves are too small, early rope failure is certain.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2156 Manchester Ave., Kansas City 26, Missouri.

Tuffy Balanced Slings and Hoistlines

1-C

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For complete information and service on all CF&I Mining Products, contact the nearest CF&I sales representative.

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In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta · Boston · Buffalo · Chicago · Detroit · New Orleans · New York · Philadelphia 7074-A

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ROCK VS. RUBBER BATTLE

continued from page 170

A record system will furnish valuable information on tire performance. Jot down tire and repair costs as a basis for your judgements on future selections. Tire manufacturers will provide the forms without cost.

In building more mileage into today's tires, manufacturers are one of your best allies in the battle between rock and rubber. Maintenance is equally as important an ally. With proper selection of tires for your job and proper care of them in service, you can deal a massive blow to tire replacement and repair costs. **END**

PERCENTAGE DEPLETION

continued from page 93

various interested groups on what they thought the "intent of Congress" to be. There has been a wide divergence of views between the Treasury Department and the taxpayers on this point, with Treasury attempting to enforce in the courts its theory that "mining" processes were allowable while "manufacturing" processes were not. In almost every instance the courts have knocked down the Treasury on this point and supported the taxpayer—stating that the controlling factor for minerals not customarily sold in the form of the crude mineral product is the question of marketability.

It is clearly apparent to everyone concerned that this situation cannot be permitted to drift on indefinitely. It is also apparent that the only way to bring any sort of coherence to the existing muddle is through specific Congressional wording that will clearly elucidate the "intent of Congress."

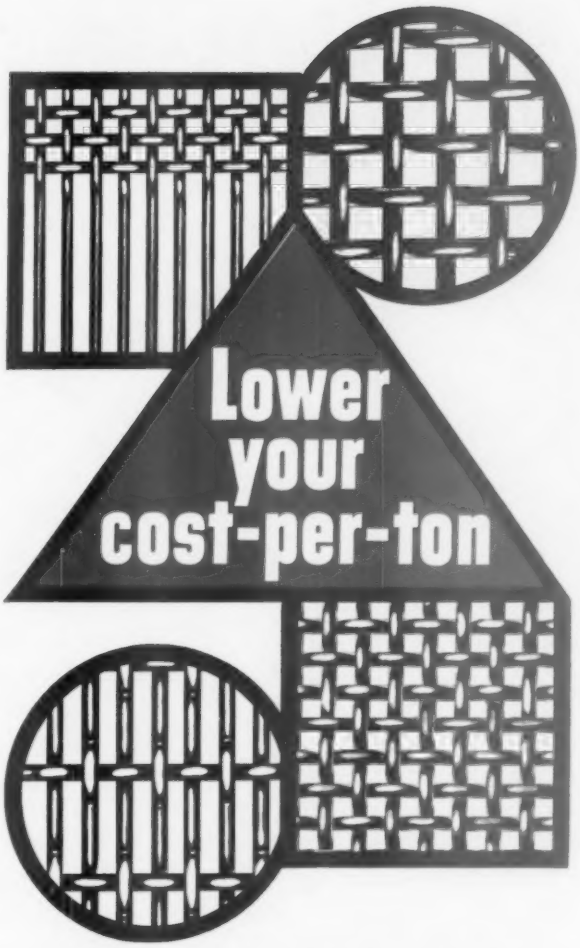
Here the matter stands at the moment.

Detailed hearings on percentage depletion before the House Ways and Means Committee in 1959 failed to produce a bill. In the meantime, the Treasury Department continues its efforts to get a court ruling favorable to its restrictive interpretation of "mining" vs. "manufacturing" processes —and for the first time in many years is flirting with such a ruling in the Cannelton case mentioned earlier.

Several projections can be made with virtual certainty:

1. There will be specific Congressional action on percentage depletion—particularly in the case of portland cement and brick and clay—in 1960.

2. The Treasury Department will harden its position and possibly seek even greater restrictions than it suggested in the 1959 hearings if it gets a favorable court ruling in the meantime—and the chances are good that it will. *Turn to page 176*



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Compare STARSTEEL better-made screens in actual operation to cut your cost-per-ton.
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Cuts Cost:

1. Saves an average of twenty-seven dollars per unit over conventional couplings by eliminating stub shaft and shortening base requirements.
2. Minimizes initial installation expense in two ways, because it can be installed quickly and because it greatly simplifies alignment.

Cuts Maintenance:

1. Completely unaffected by dirt, dust, mud, water, oil and weather elements.
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5. Outlasts other couplings—cushions transmit load to eliminate wear on metal jaws.

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PERCENTAGE DEPLETION

continued from page 175

3. The rock industries should be united—as far as possible—in supporting a reasonable position in the percentage depletion dispute. **END**

Editor's Note: This article is another in a series on the important subject of percentage depletion. The topic is particularly timely now, since the Supreme Court soon will review the Cannelton Sewer Pipe Case, so vitally important to our industry. We shall continue to bring you discussions on depletion, as future developments warrant.

ROCKY'S NOTES

continued from page 18

dredging by the Sandusky division in the late fall of 1954 was a normal procedure. At the conclusion of the 1954 dredging season, the Kelley Island company made necessary, costly repairs on its vessels in preparation for the 1955 season. Customers and orders were secured for the 1955 season. In other words, the Examiner contended, operations which normally were engaged in during the off season were continued by the Sandusky division. "A company which has been engaged in interstate commerce," said the Commission, "does not cease to be in interstate commerce simply because seasonal considerations temporarily halt or curtail activities."

The company argued further regarding "the relevant market" as defined in Section 7 of the amended Clayton Act (part of the antitrust laws) that its market territory is too small a geographical area to meet the statutory requirement; that the law refers to an extensive territory, not a mere "community." The Commission states: "What constitutes a 'section of the country' is not capable of rigid definition, and its application will vary according to the particular facts of each case." In this case the Commission upheld the Examiner in considering Erie company's market territory as a "section of the country" and considerably more than a "community."

The Erie company further argued that there are large quantities of bank and pit sand sold in competition with lake sand. The Commission contends, however, that most bank and pit sand mentioned in the respondent's analysis is sold outside of the relevant market area. It states further: "The quantities sold within the market area are so small that their consideration would not affect the final determination in this matter." Moreover, the Commission states, "lake sand is a sufficiently distinct product to be considered a 'line of commerce.'"

Please turn to page 178

BLASTHOLER

ROTARY DRILL CUTS COSTS— SPEEDS BLASTING

BLASTHOLER

ABOVE: Track and tire-mounted BLASTHOLERS drilling 25′ blast holes without adding steel in a hard limestone quarry.

This self-propelled rotary drill can really start your production on the up-swing — save you money, too! 2 to 5 times faster than other cumbersome equipment, the BLASTHOLER requires only one operator, carries own air for cleaning hole. Standard BLASTHOLER drills 20′ holes 3″ in diameter without adding steel. Optional equipment gives you depths to 50′. BLASTHOLER mounts on tracks or dual pneumatic tires to meet your terrain requirements. Cut costs — speed blasting! See the BLASTHOLER today!

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ROCKY'S NOTES

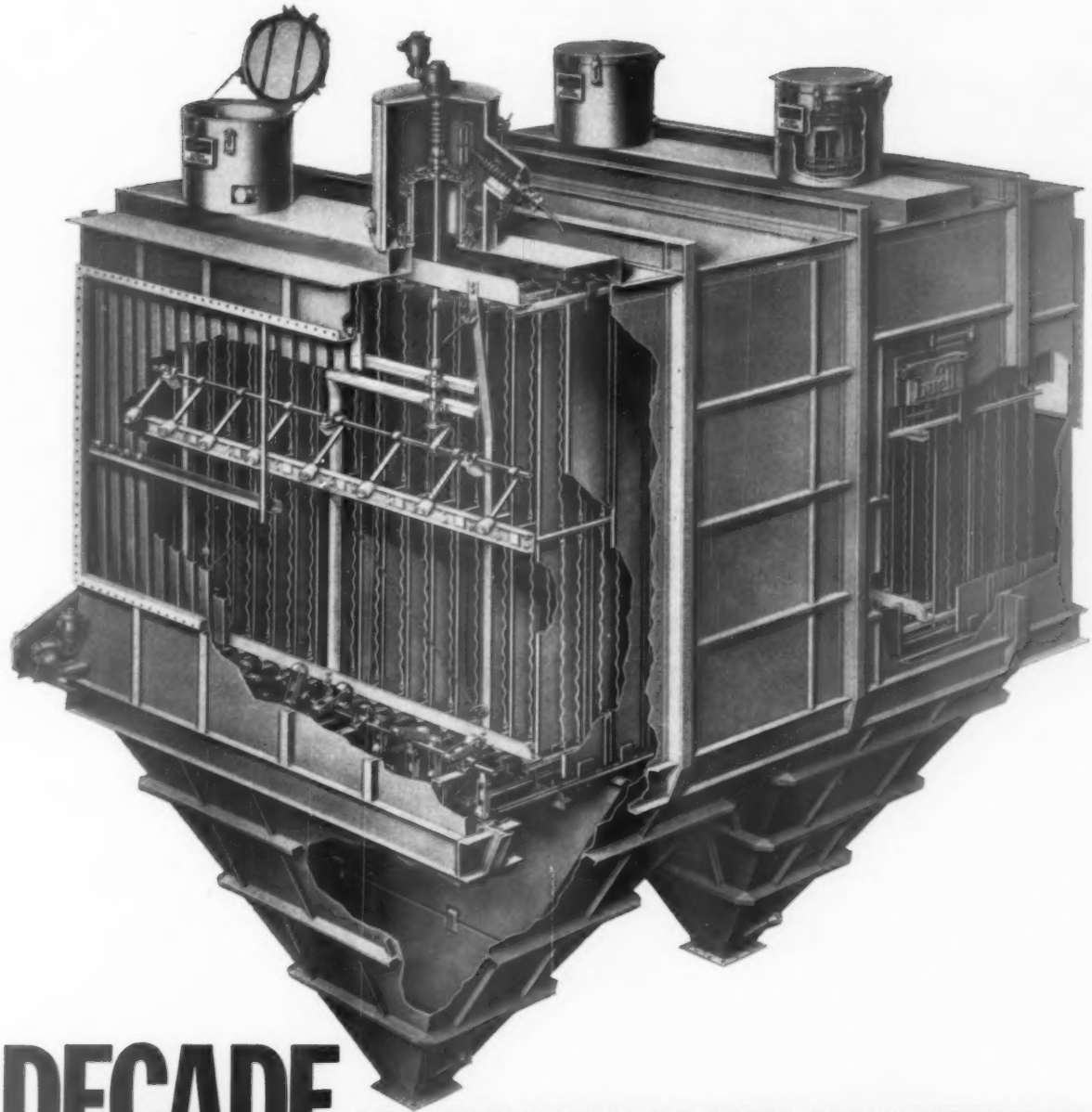
continued from page 176

There does not appear in the Commission's order any proof that the Erie company used its alleged monopoly to gouge its customers through unfair prices. The Commission's reasoning is merely based on the fact that the company controlled some 90 percent of the product sold in its market area. The company's competitors now are said to be "small operators with limited means; they do not have docks or other facilities which might enable them to effectively challenge the respondent's now dominant position."

We do not have a copy of the Erie company defense, but it seems to us that it could very well have argued (as perhaps it may have) that the inability of its small competitors to get into its market territory could very well have been explained by the efficiency and completeness with which that territory was being served. If prices were sufficiently high, more of the competitors' material would certainly have found a way to compete.

However, the Commission ruled that "public interest" required the Erie company to break up its organization and reestablish the Sandusky acquisition as a competitor. Naturally, the company complains: (1) that the Commission's power to order divestiture does not include the power to require the establishment of a competitive entity comparable to the merged firm, and (2) that the order applies to vessels and properties owned not by the respondent but by subsidiaries, and that the complaint contains no allegation that these subsidiaries are under the direction, domination and control of the respondent.

So far as our knowledge goes this is a unique example of the operation of an antitrust law. It will be interesting to see the outcome. How does one go about establishing a competitor who will have to use part or all of the facilities you are in possession of? Is the public going to be benefited by having two operators in place of one? We have never known of a large secure market served by two competitors where one did not figure he was entitled to as good a price as the other. Two independent grocers will do that. It is not collusion; it is business sense. Moreover, since unit cost of production and distribution is so largely influenced by the volume over which the total cost is spread, it is obvious that the cost will be greater for two producers than for one. It is only when one or the other starts cutting prices that elimination of competition is to be feared. It seems a rather farfetched conclusion that the public interest is necessarily served in this sand and gravel instance, unless there are factors not brought out in the Commission's statement. **END**



DECADE OF OPERATION PROVES MAINTENANCE OF BUELL 'SF' PRECIPITATORS AVERAGE LESS THAN 2%

In 10 years of selling 'SF' electric precipitators, the number of replacement parts ordered from Buell has amounted to only 1.17% of the total sales! Even on emitting electrodes, usually the most vulnerable part of a precipitator, replacement has amounted to less than 1% of the original number installed. What do these extremely low percentages mean? Exceptionally low maintenance costs, for one thing, continuous high-efficiency operation, fewer shutdowns and process interruptions. Buell self-tensioned emitting Spiralectrodes eliminate vibration found in weight-tensioned wires. Buell's low maintenance precipitators will provide you with the most satisfactory operating results. They're backed by 25 years of experience in dust collection, with the practical know-how gained on hundreds of installations. Write for descriptive literature. The Buell Engineering Company, Inc., Dept. 17-B, 123 William Street, New York 38, New York. (Subsidiary: Ambuco Limited, London, England).

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NEW LITERATURE

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2¾-cu. yd. loader

EIMCO CORP. has released a bulletin on its 205-hp., 2¾-cu. yd. crawler loader. Its new diesel V6 engine has the most power of any crawler front-end loader, the maker states.

Unidrive transmission, single-stage torque converter and dual final drives make it "the ultimate in maneuverability and ease of control." Also noted in Bulletin L-1092 are: 18½-sec. loading cycle, capacity at carry height of 20,000 lb., top stability with 12 in. track oscillation.

Enter 500 on Reader Card

Spotters for rail cars

LINK-BELT CO. has released a brochure on car spotters and car pullers. Titled "Haulage Machines," Book 2892 gives 14 typical layouts illustrating use of the spotters. One such is in spotting barges beside a dock.

The spotters are of two types, capstan car spotters and drum-type car pullers, and are available in a wide variety of sizes.

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Two-way radio

GENERAL ELECTRIC CO. has announced Bulletin ECR 666, describing its new Transistorized Progress Line two-way radio equipment. Very small size and low power when set on "standby" (less than power used by a car clock) are advantages described. The low standby power means the radio may safely be left on, ready to receive a call at full volume, even with the car's engine off, the maker states.

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Company profile

MCNALLY PITTSBURG MFG. CORP. has released Bulletin 757, giving a profile of its products and plant-design facilities. The firm has designed and equipped several lightweight aggregates plants, and makes equipment used in most rock products plants. Pumps, conveyors and kilns for lightweight aggregate operations are three such products. With plants in Pittsburg, Kan., and Wellston, Ohio, the firm has its own foundry and machining facilities.

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Barite, fluorspar flotation

DENVER EQUIPMENT CO. is distributing Bulletin M7-F67, a flowsheet study of the complex problem of flotation of lead-barite-fluorspar ores. The flowsheet illustrates the entire process, from coarse ore bin to the dryer. Critical elements in the mineral processing problem are the reagents, the company states; several new and effective reagents are discussed.

Enter 504 on Reader Card

11-ton crane-excavator

LITTLE GIANT CRANE & SHOVEL, INC. has issued literature describing its Model 24 crane-excavator. A descriptive folder details the advantages of the 11-ton unit's ball bearing turntable and patented clutches. On the clutches, ventilated drums cut fade-out, and split spiders simplify field maintenance and adjustment. Both crawler and carrier mounts are available. A second sheet gives specifications, including digging capacities and dimensions.

Enter 505 on Reader Card

Selecting welding electrodes

HOBART BROTHERS CO. has just finished a new film titled "Arc Welding Electrode Selection." First of its kind, the 16-mm. color film runs 25 minutes. An outline of steps to follow in selecting electrodes is given: base metal identification, welding currents, welding positions, thickness and shape of base metal to be welded, joint design and fit-up, service conditions, production efficiency, environmental and job conditions.

Producers may borrow the film by writing the firm's film library at Troy, Ohio.

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35-ton rear-dump wagon

EASTON CAR AND CONSTRUCTION CO. is distributing Bulletin 2-A8, describing its new 35-ton rear-dump wagon. Designated model TS-2635,

the unit is designed to work in combination with the Euclid Model 30 LOT single-axle wheel tractor.

Features include 50-50 weight distribution when loaded, 335-hp. on the tractor, and all trailer tire and wheel parts interchangeable with those on the tractor.

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(Continued on page 183)

MANITOWOCS SET THE PACE FOR HIGHER PRODUCTION

For steady, big output, you've got to go some to match the performance of a rugged Manitowoc rock shovel. However, increased tonnage and faster cycles aren't the whole story. Manitowocs cost less to operate . . . are "down" less because they're built to take a generation of tough quarry punishment.

Picture of rock going places in a hurry

Review for a minute these reasons why a Manitowoc in your pit returns the most for your investment. Here are sure-footed crawlers with a huge, one-piece carbody mounted right on the crawler frames . . . stays in perfect alignment even after years of hard rock work. Manitowocs have the most simple design of any big machine available, with fewer power-wasting gears; a well-balanced, compact main machinery deck; and heavy, rugged parts that last a long time without fixing. Powerful, reinforced shovel booms and rugged, twin dipper sticks are built to take it. The fast, positive chain crowd "bulls" the dipper into the pile for a full payload. Air controls make operation a cinch . . . let your men put out more per hour. Torque converter power take-off balances power to the load — is easier on man *and* machine.

But words don't mean a thing without the real thing to back them up . . . and Manitowocs have the stuff, all right! Send for a copy of the informative booklet, "Manitowoc for More Profitable Production" and see for yourself what we mean.

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

SHOVELS AND DRAGLINES, 1¼-6 YDS. • CRANES, 25-125 TONS

Enter 1098 on Reader Card

Save with NEW WONDERWALLS!

During a controlled test to determine possible savings in bag costs, 24 plants moved 1,118,415 barrels of cement in 5,282,966 new WONDERWALL bags. *Typical saving:* $2.75 per M bags and reduced bag breakage as well.

NOW AVAILABLE! Stepped end WONDERWALLS from our plants at Wellsburg, W. Va., New Orleans, La., and Torrance, Calif.

WONDERWALLS save users money because they're made with Kraftsman Clupak*, the extra tough paper with the built-in *stretch*... pioneered by West Virginia. Because less paper is needed, substantial savings in bag costs naturally follow.

When it's a WONDERWALL, it withstands punishment that breaks ordinary multiwalls, and it also packs faster, handles easier, stacks better.

See how WONDERWALLS can cut *your* direct bag cost and reduce bag breakage too. For full information, write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N. Y., or 1400 Annunciation Street, New Orleans 13, La.

**Clupak Inc.'s trademark for extensible paper, manufactured under its authority.*

West Virginia Pulp and Paper

Enter 1097 on Reader Card

NEW LITERATURE

(Continued from page 180)

Vinylon conveyor belt

BANDO RUBBER MFG. CO., LTD. is now marketing a rubber conveyor belting using vinylon synthetic fiber. The following advantages over cotton and rayon belting are reported. First, longer flexing life is claimed; in a test Vinylon failed at 43,000 bending cycles, while cotton failed at 36,000 and rayon at 32,000.

Further, better adhesion between plies, greater tensile strength (18 percent greater than rayon) and good resistance to water and chemicals are given as other advantages. The belting is described in a brochure the company has released.

Enter 508 on Reader Card

Filter cloth comparisons

WHEELABRATOR CORP. has published a filter-cloth comparison chart which permits producers to compare the strengths and weaknesses of the several filter-cloth materials in common use in dust collectors today. Cotton, orlon, nylon, dacron and silicone-treated glass are the materials mentioned. Temperature limits; strength; resistance to acid, alkali and abrasion, and relative cost are compared.

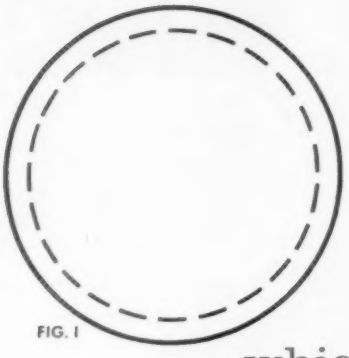
Enter 509 on Reader Card

Processing equipment

JEFFREY MANUFACTURING CO. has released a brochure describing its line of feeders, conveyors, coolers, dryers, weigh feeders, vibrating screens and other equipment. Catalog 978, a 12-page book, describes each type of equipment briefly; a separate catalog is available for each type.

Enter 510 on Reader Card

(Continued on page 191)



which dotted circle is the larger?

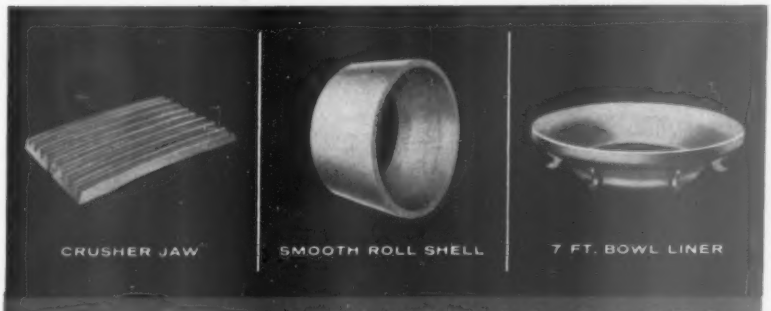
Your eyes tell you that the dotted circle in figure 1 is greater in diameter than figure 2. Actually, the figures are of equal diameter.

Many of us are fooled by an illusion of another sort; the illusion that all crusher replacement parts are of equal value. This illusion can lead to one of the most costly investments one can make.

You can prove this to yourself by ordering Columbia Armor-Tough Manganese Steel replacement parts. Then COMPARE the cost of down time, the cost per ton, the cost per week of service. No matter how you measure it, you will find that Columbia crusher components are your best investment . . . because Columbia parts are "beefed up" where it counts, where rock meets metal.

Don't be fooled by the value illusion. Insist on the savings that only extra Columbia quality can assure you.

Send for the new illustrated Columbia Bulletin No. 1063, featuring crusher, tractor, shovel, bucket replacement parts.



Columbia

COLUMBIA STEEL CASTING CO., Inc.

933 N. W. Johnson, Portland 9, Ore. • Ph.: CA 7-0555

Eastern Office: 413 Empire Building, Pittsburgh, Pa.
Midwestern Office: 8000 Beaubien Ave., Clayton, Mo.

Enter 1069 on Reader Card

Now joining the Case line of unit loaders...

NEW 9000-lb., 2½

Case Engineered...
Case Powered...
Case Built

Equipped with constant-mesh power-shift transmission, power-boosting torque converter, power-transfer differential and effortless rear-wheel power-steering. Optional: 1¾ cu. yd. heavy-duty bucket with digging teeth, 3½ cu. yd. light material bucket.

Big 16.00 x 24, 12 ply tires... speeds to 23 mph

23,500 lbs. breakout... 40° bucket rollback

cu. yd. CASE® W-12

Designed to achieve the ideal power-torque-weight ratio for unprecedented work capacity... unequalled operating economy.

Powered by the big, heavy-duty 120 gross hp Case diesel engine — proved in millions of hours of operation all over the world — the new four-wheel drive Case W-12 loader is ruggedly-built to withstand the toughest kind of pit and quarry operation. Compared with all other unit loaders in its capacity range, the W-12 offers you these important advantages:

1. *Up to 30% faster hoisting and lowering time* . . . cuts cycle time almost one-third.
2. *Up to 70% greater forward-reach* . . . saves time . . . lets operator dump load into center of truck without ramming.
3. *Far better balance and stability* . . . wide 77¾" tread, plus 26% more empty-weight on rear wheels, gives greater stability, better traction for digging . . . enables operator to raise full bucket on-the-go without tipping.
4. *Easier, safer to operate* . . . forward mounting of loader arms lessens the danger of catching operator's arm in lifting mechanism.
5. *Up to 19% saving in initial cost* . . . means more output per dollar of investment, lower cost per yard or ton of material handled.

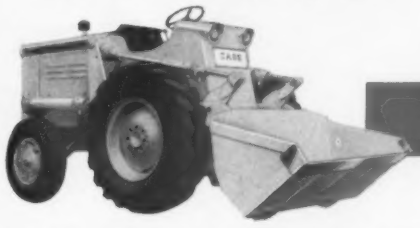
For convincing proof, ask your Case Industrial Dealer for a free demonstration, or mail handy coupon for full details.

CASE

J. I. CASE COMPANY, RACINE, WIS.

9 ft. dump clearance . . . 17 inch ground clearance

Sizes to fit every job



W-5

3000-lb. capacity—1 to 1½ cu. yd. buckets

W-9

5500-lb. capacity—1¼ to 2¾ cu. yd. buckets

W-10

6500-lb. capacity—1¼ to 2⅞ cu. yd. buckets

CLIP...MAIL TODAY

J. I. CASE CO., Dept. B1470, Racine, Wis.

Please send full descriptive literature on:

☐ 9000 lb. W-12 ☐ 6500 lb. W-10 ☐ 5500 lb. W-9 ☐ 3000 lb. W-5

☐ Have nearest dealer call to arrange demonstration.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

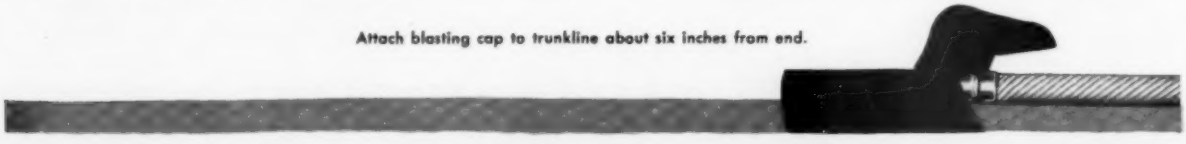
C-TL-439

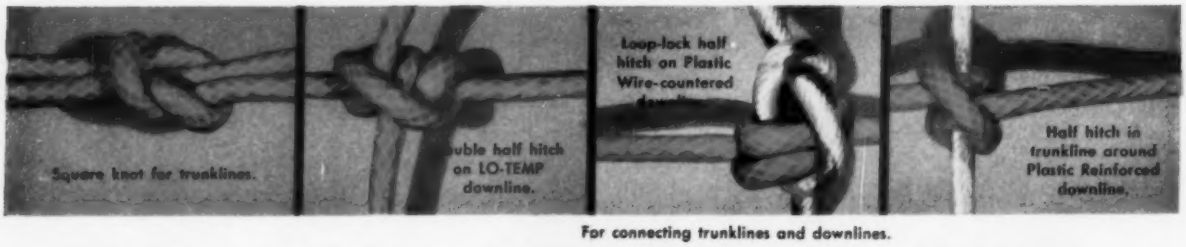
Don't let a cold wave tie you up . . .

Use LO-TEMP® Primacord®— flexible at 40°F. below

When Old Man Winter is on the loose, you can still make tight knot connections with Primacord downlines when your trunkline is Lo-Temp Primacord. It remains flexible at low temperatures and its plastic cover and textured surface resists slip-back. Ideal for trunklines at any time and can be used for in-hole priming wherever conditions do not call for more rugged types. Lo-Temp is resistant to oil and water penetration, is light in weight, tough, strong, easy to handle.

Like all types of Primacord, Lo-Temp is very insensitive to initiation by shock, friction, sparks or electricity, but must be initiated with fuse and cap or electric blasting cap. It explodes at a velocity of 21,000 feet per second with the initiating energy of a blasting cap throughout its entire length.




Square knot for trunklines.
uble half hitch on LO-TEMP downline.
Loop-lock half hitch on Plastic Wire-countered
Half hitch in trunkline around Plastic Reinforced downline.

For connecting trunklines and downlines.

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut – Since 1836

L-3

Enter 1096 on Reader Card

READER-SERVICE CARD

RP-2-60

ROCK PRODUCTS
79 W. Monroe St.

FEBRUARY, 1960
Chicago 3, Illinois

Cannot be serviced after April 1, 1960 postmark.

Please print or type

Name_____ Position_____

Company (In Full)_____

Company Address_____ City_____ Zone____ State_____

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

– POSTAGE WILL BE PAID BY –

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

BUSINESS REPLY CARD
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

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ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

READER-SERVICE CARD

RP-2-60

ROCK PRODUCTS
79 W. Monroe St.

FEBRUARY, 1960
Chicago 3, Illinois

Cannot be serviced after April 1, 1960 postmark.

Please print or type

Name _____ Position _____

Company (In Full) _____

Company Address _____ City _____ Zone _____ State _____

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(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
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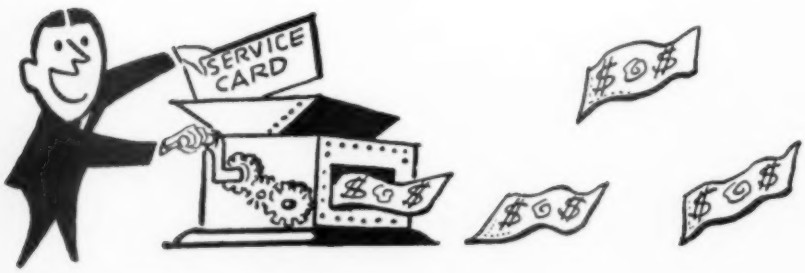
There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

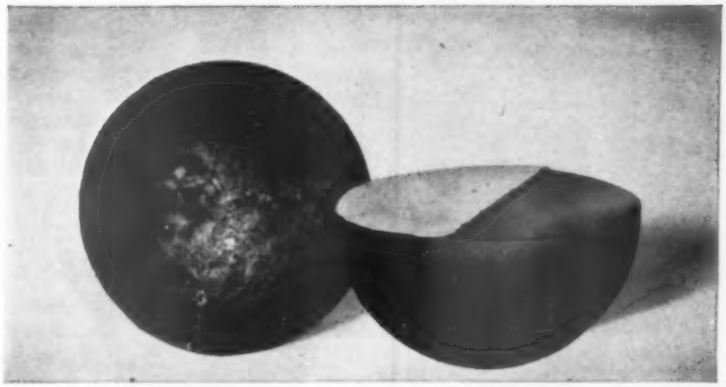


consistently

UNIFORM

grinding economy

SHEFFIELD
ARMCO
MOLY-COP
COPPER-MOLYBDENUM-ALLOY
Grinding Balls



Ball after ball, charging after charging, carload after carload—uniformity is a sure thing with Moly-Cop Balls. Uniformity of toughness and hardness. Uniformity of fine, dense grain structure. Uniformity of longer service, less down time and better grinding at lower cost. That's the result of Sheffield quality control in alloying, forging and heat treating—from furnace to finished ball.

The Standard of Comparison Around the World

SHEFFIELD DIVISION

Sheffield Plants in Kansas City, Tulsa and Houston

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Enter 1047 on Reader Card

SYNTRON cost-cutting equipment of proven dependable Quality

for heavy tonnage conveying

SYNTRON Mechanical

VIBRATING CONVEYORS

—multi-purpose units designed for high speed conveying of sand, gravel, stone and many other bulk materials in densities ranging from 5 to 400 pounds per cubic foot and in sizes from powder to large chunks.

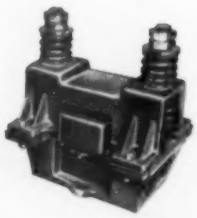
They can be fitted with screen sections to provide both conveying and screening.

Low initial cost — low power requirements — simple construction assures maximum performance with low maintenance.

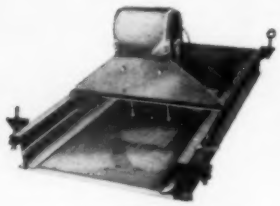
SYNTRON Vibrating Conveyors are available in lengths and widths to meet most requirements.

Write for free informative Catalog today

Other SYNTRON Equipment of proven dependable Quality

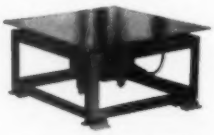


BIN VIBRATORS



VIBRATING SCREENS

DRY FEEDER MACHINES



VIBRATORY PACKERS

TEST SIEVE SHAKERS

SYNTRON SINCE 1921

Enter 1110 on Reader Card

SYNTRON COMPANY

450 Lexington Avenue — Homer City, Pa.

Sales offices in principal cities in the United States and Canada—Agents in most Foreign countries.

NEW LITERATURE

(Continued from page 183)

Electric screens

THE W. S. TYLER CO. is distributing a 24-page catalog describing its Hummer electric screens. Very low operating costs are reported for the screens, which have no bearings, require no lubricants and have very low power requirements.

Commonly used on silica sand, clay and granular fertilizer, the screens are available in both closed (for dusty materials) and open designs. Hum-mer screens handle both wet and dry materials, the catalog notes, and handle "hot material better than any other known device." Angle of the sloping screens is adjustable, as is the intensity of vibration. Hum-mer models reportedly are widely used in closed circuit with crushers.

Enter 511 on Reader Card

Jaw crushers to 48 x 60

ALLIS-CHALMERS MFG. CO. has released bulletin 17B6369E on its line of A-1 jaw crushers ranging in size from 32 x 42 up to 48 x 60 in.

The crushing chamber is up to 35 percent deeper, and the crushing angle is smaller, thanks to jaws which are up to 20 percent longer. This nonchoking design means easy crushing of the largest material which can enter; also, it means reduced slippage, important with hard, tough materials. Longer pitman and front toggle mean less power required. Finally, lower structural stresses, simplified design and roller bearings cut maintenance costs.

Enter 512 on Reader Card

Spray nozzles for screens

THE DEISTER CONCENTRATOR CO. is distributing literature on its line of water spray nozzles for vibrating screens. The nozzles are quickly assembled, watertight, require no threads and are nonclogging.

Enter 513 on Reader Card

Conveyor motion indicator

THE BIN-DICATOR CO. is distributing a bulletin on its Roto-Guard, a motion indicator which is valuable as a safety device on conveyors, feeders and other process machinery where stopping or slowdown may cause damage. One use, for instance, is on conveyors; the Roto-Guard will signal an operator of slowdown, stoppage or belt breaks. This can prevent pile-ups of material.

The unit converts rotary motion into an electrical signal which can be used to energize an alarm system or to operate control switches automatically.

Enter 514 on Reader Card

Cement plant equipment

MIAG NORTHAMERICA, INC. is distributing literature describing the firm's crushers, calcinators, mills and kilns. The German-based firm also supplies complete cement plants.

Enter 515 on Reader Card

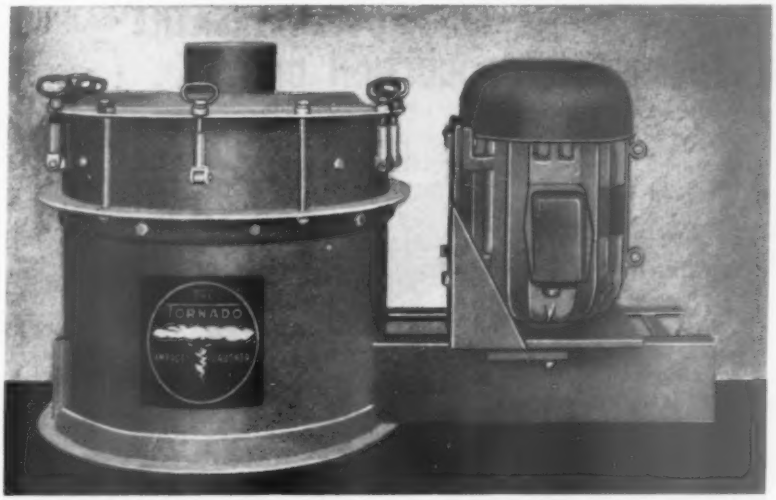
Bin, hopper, feeder vibrators

CANNON VIBRATOR CO. has released a brochure describing its "quiet type" and "hammer type" vibrators. Catalog 58 outlines features of the units, which have chrome plated pistons (for long life) and close tolerances (for high efficiency).

Made in sizes weighing from 8 to 180 lb., the quiet type is cushioned by air at each end of the stroke, giving a powerful action yet eliminating most noise. The hammer action of the second type gives an even harder impact, for very hard-to-move materials.

Enter 516 on Reader Card

(Continued on page 192)



Compare The TORNADO

Feature by feature, the Tornado Impact Crusher offers many advantages. In its category, generally, the Tornado represents one-half the initial cost with three times the productive capacity of other crushers. You're ahead with initial installation of the Tornado . . . you stay ahead during operation. Check and compare. See for yourself how the Tornado could improve your profit picture.

The TORNADO Challenges Comparison!

FEATURES	THE TORNADO	Crusher —A—	Crusher —B—	Crusher —C—	Crusher —D—
Low Initial Cost	Yes	No	No	No	No
Production	High	Variable	Variable	Variable	Variable
Power Requirements	Low	Variable	Variable	Variable	Variable
Men needed to install Replacement Parts	One	Three	Three	Four	Five
Time Required for Replacing Wear Parts	10 to 30 Minutes	1 Day	1 Day	3 Days	2 Days
Crane Necessary	No	Yes	Yes	Yes	Yes
Quality of Product	Excellent	Fair	Fair	Fair	Fair

WERCO Steel Company

2151 East 83rd Street / Chicago 17, Ill., U.S.A. / Phone ESsex 5-8446

Send for our new descriptive brochure "The Key to Greater Profits"

Enter 1020 on Reader Card

NEW LITERATURE

(Continued from page 191)

Trucks to 60,000 lb. gcw.

DIAMOND T MOTOR TRUCK CO. is distributing literature on its three new gasoline-engine trucks, 534, 634 and 734R. All are powered by the firm's wet-sleeve, short-stroke engines. The wet sleeve feature means that when overhaul time comes, it is necessary only to remove the worn sleeves and clean the block interior; no reboring of the block or oversize parts are required. Gross combination weight ratings are up to 60,000 lb., and gross vehicle weights go to 46,000 lb.

Enter 517 on Reader Card

Aggregate size in concrete

NATIONAL SAND AND GRAVEL ASSOCIATION has released a booklet giving its findings in "Relationships of Concrete Strength to Maximum Size of Aggregate." Some of the findings: Highest strengths were secured with a maximum size aggregate of ¾ in., slightly lower and about equal strengths with the 1½ and ⅜-in. top sizes, and lowest strengths with 2½-in. maximum size. This was true even though less mixing water was required with larger maximum sizes. Single copies are available free.

Enter 518 on Reader Card

Business management help

KNOX ASSOCIATES OF ILLINOIS, Inc. is distributing "Counseling and Operating Services," a bulletin describing the firm's advisory service to business management. The firm gives advice in general management, sales, marketing research and office systems and procedures. When do you need a consultant? The booklet notes that, if you have a management problem and have neither the range of talents needed to solve it, nor the time, a consultant should be considered.

Enter 519 on Reader Card

Buying used equipment

CATERPILLAR TRACTOR CO. is distributing a buyer's guide which outlines three different guarantee programs available for purchase of used equipment. Called "Get Guaranteed Satisfaction," booklet D923 describes a number of jobs where used machinery is commonly employed. It also lists three different programs—Bonded Buy, Certified Buy and Buy-and-Try—offered by Caterpillar dealers.

Enter 520 on Reader Card

Standard motors

LOUIS ALLIS CO. has published an 8-page bulletin that describes their complete line of ac. and dc. standard motors, special motors, gearmotors and adjustable speed drives. The bulletin gives information on motors and drives for the materials handling, petroleum and chemical industries. It summarizes the characteristics and modifications for 20 basic types of motors and drives ranging from ¾ to 2,000 hp.

Enter 521 on Reader Card

Belt fasteners

CRESCENT BELT FASTENER CO. has issued Brochure 434, giving sizes and prices for its line of fasteners for joining and repairing conveyor, elevator and transmission belting. The brochure notes that the rivets are self-piercing and self-clenching, meaning no holes to align and bore. A new repair kit is available which contains an assortment of fastener plates.

Enter 522 on Reader Card

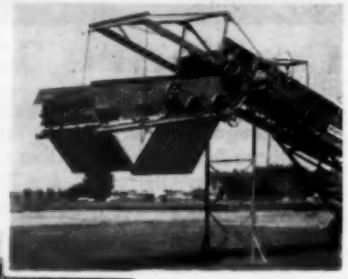
END

KOLMAN MODEL 101 PROVES VERSATILE AS AGGREGATE PRODUCTION UNIT

40" x 10' KOLMAN TRIPLE - DECK Screen on 50' x 42" Model 101.

Extra Big Multi-Deck Screens Give High Capacities on Portable Plant

With a choice of single, double, or triple deck screens on the KOLMAN Model 101 Portable Conveyor-Screen Plant, a variety of operations in the production of aggregate can be performed easily and economically. Making specification material, prescreening ahead of crushers, scalping and rejection, classifying, washings, blending, or simply high-speed loading—all are efficiently accomplished with this rugged, low cost plant.



Above, 5' x 12' double-deck screen on Kolman 101.

Left, two 5'x12' single-deck Kolman screens were mounted on 60'x42" 101 conveyors to produce over 2,000 t.p.h. of minus 1½" base course gravel.

And complete versatility is provided through the wide choice of feeding accessories available on a KOLMAN Plant. Push Loading operations are handled with a Dozer Trap or a Feeder-Trap Combination—"Top Loading" with Hopper or Feeder-Hopper Combination and a Conversion Hopper for Traps makes either Push Loading or Top Loading feasible with the same plant.

Send for more details about how KOLMAN Plants, as well as other KOLMAN aggregate equipment, can fit into your materials producing picture. You'll be glad you did.

Enter 1091 on Reader Card

Write for Literature

KOLMAN MFG. CO.

4200 West 12th St.

Sioux Falls, South Dakota

4-wheel tractor-scraper with Hi-Torque brakes

Heavy rear dump with Hi-Torque brakes

For your heavyweight vehicles get double braking power with Hi-Torque brakes

Operators of heavy off-road vehicles are finding that Hi-Torque brakes boost their profits—and that's a feature to consider when choosing *your* heavy equipment.

Hi-Torque brakes give the "heavyweights" adequate safety and controllability—stop vehicles in approximately half the distance required for conventional two-shoe brakes. With this reserve braking power, cycle time can be reduced as equipment is operated in higher gear. Operators can tackle grades usually considered unsafe, since Hi-Torque brakes don't fade, will stop a fully loaded vehicle downhill!

Specify Hi-Torque brakes on your equipment—ask the vehicle manufacturer for details. Or write *B. F. Goodrich Aviation Products, a division of The B. F. Goodrich Company, Dept. RP-2, Troy, Ohio.*

2-wheel tractor with Hi-Torque brakes

Full circle contact with drum is provided by Hi-Torque brakes giving maximum effective braking surface in the same size unit. Hi-Torque stops vehicles twice as fast as conventional brakes.

B.F.Goodrich

Hi-Torque brakes

Enter 1095 on Reader Card

NEW PATENTS

by OLIVER S. NORTH

RECENTLY ISSUED PATENTS ON NONMETALLIC MINERALS*

Phosphate rock

U. S. 2,913,329—Process for making complex fertilizers wherein the **phosphate rock** is digested in a molecularly proportioned mixture of sulfuric acid and nitric acid, and the reaction mixture ammoniated in a series of vessels the last of which represents a marked increase in pH, to a value of 6 or 7. Detrimental gel formation in the pH3.5 to 6 range is avoided. (to K. Geiersberger and H. Nees; assigned to Chemische Fabrik Kalk G.m.b.H.)

U. S. 2,913,330—Method for continuous manufacture of granulated or nodulized triple superphosphate from **phosphate rock** and phosphoric acid, wherein the formation of a gummy material in the process equipment is prevented. (to J. F. Wilson; assigned to Phillips Petroleum Co.)

U. S. 2,914,173—Froth flotation method of processing Florida **phosphate rock** to recover a bulk concentrate containing zircon, ilmenite, rutile, monazite, **sillimanite, garnet** and like metallic minerals in addition to a phosphate concentrate. (to I. M. Le Baron; assigned to International Minerals & Chemical Corp.)

U. S. 2,914,174—Economical two-stage froth flotation process for separating silica from phosphate values in **phosphate rock.** A collector consisting of an amine residue is used, the phosphate being recovered from the underflow and the silica tail floated. (to J. F. Haseman; assigned to International Minerals & Chemical Corp.)

U. S. 2,914,380—In a method for producing monocalciumorthophosphate from raw **phosphate rock,** the dilute phosphoric acid digestion solution is contacted with butanol or other organic solvent to extract H_3PO_4 from the solution and precipitate the $Ca(H_2PO_4)_2$. (to R. C. Vickery; assigned to Horizons Inc.)

U. S. 2,916,372—Production of citric acid-soluble fertilizer from **phosphate rock.** Silica and soda are added to the raw rock, and the mixture granulated and calcined. (to F. Schytil; assigned to Lurgi Gesellschaft fur Chimie und Huttenwesen m.b.H.)

Vermiculite

U. S. 2,912,740—To retard carbon destruction of blast-furnace clay type tuyeres and refractories, a space is left between the lining and the shell, and this space is filled with a mixture of high-sulfur coke and a thermally insulating granular material, such as clay, grog, crushed **blast-furnace slag,** exfoliated **vermiculite,** etc. (to T. F. Berry; assigned to U. S. Steel Corp.)

Kyanite

U. S. 2,912,729—Use of **kyanite,** zircon or other refractory aggregate in an improved refractory mold for precision casting of metals having high melting points. (to J. M. Webb)

Gilsonite

British 819,803—Method of treating **gilsonite, glance pitch** or **grahamite** to provide a suitable feed for a contact coking operation. A solution is formed consisting of the ground asphaltite and a liquid hydro-carbon of selected boiling range, and the mixture heated under controlled conditions to avoid coking, and the heater effluent passed to a distillation column. (to W. J. Bloomer and V. Mekler; assigned to The Lummus Co.)

Gypsum

U. S. 2,913,308—In the production of calcined **gypsum** of low consistency and very high strength, lump gypsum rock is autoclaved under optimum conditions in a very dilute solution of, for example, potassium succinate, and the gypsum then separated and heated in an atmosphere of steam to complete formation of small, stubby gypsum crystals which are recovered, dried and ground. (to M. C. Dailey and E. S. Johnson; assigned to United States Gypsum Co.)

U. S. 2,913,346—Use of **gypsum** plaster in the making of lightweight bodies used by florists for preserving cut flowers. (to H. E. Hoffman)

U. S. 2,914,421—Use of natural crude **gypsum** in the making of bandages. (to A. Wiener; assigned to Manufacture de Bandes Platrees Adhesia)

British 822,277—A composition for bonding **gypsum** plaster or concrete to walls of concrete block, clay brick, wood and other structural materials compirses an aqueous emulsion of a polyvinyl resin acetate and a plasticizing agent. This patent is substantially the same as U. S. Patent No. 2,760,-885, dated Aug. 28, 1956. (to P. H. Larsen and G. G. Groome)

Silica sand

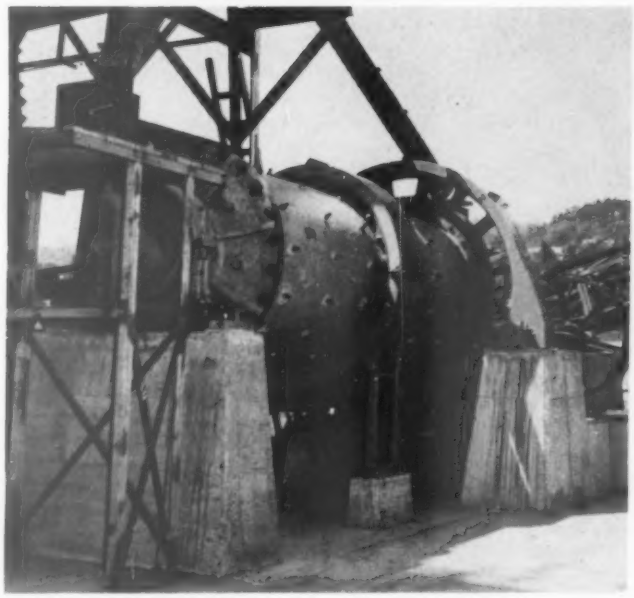
U. S. 2,911,286—To remove impurities from **silica sand** and produce high-purity fused silica, the impure sand is mixed with ammonium chloride or the like, and the mixture heated in an electric furnace to volatilize and drive off contaminants and fuse the silica into a billet of high whiteness. (to C. Potter; assigned to Engelhard Industries, Inc.)

Dolomite

U. S. 2,912,306—To produce low-lime magnesia from **dolomite,** burned dolomite is dry slaked with a dilute aqueous solution of $Ca(NO_3)_2$, and the resulting hard, dry hydrate granules are reacted with a mother solution of raw dolomite and HNO_3. MgOH is precipitated and CaO goes into solution. The MgOH is filtered off, washed, dried and calcined. (to O. Kippe; one-half assigned to Paul O. Tobeler, d.b.a. Trans-Oceanic) **END**

How small sand producers can beat the competitive squeeze with MARCY MILLS

Specification sands for most of the large government dams throughout the world have been produced by use of Marcy Center Peripheral Discharge Rod Mills. Also, large commercial sand producers have, for many years, used Marcy Mills to make a better product and increase their profits.



Here's how small producers can profitably use Marcy Mills...

- **Make a profit out of waste material.** By grinding waste pea gravel you not only make an additional profit from waste material, but also eliminate a stockpiling problem.
- **Increase sales by making a better product.** Grinding, compared with crushing, makes a more uniform, cubical product which makes better concrete...thus, gives you an opportunity to increase sales, by having a better product.
- **Increase markets by meeting a wider variety of specifications.** Marcy Mills provide a flexibility which permits changing the gradation of finished product to meet a wide variety of specifications.

Capacities from 2 to 200 dry tons per hour.

For complete details, write to

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NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail the postage-paid Reader Service Card found elsewhere in this issue

Portable seismograph—prospecting, no blasting

NEW ROCK PRODUCTS PRODUCERS can do their own seismograph prospecting with a newly developed portable instrument. This 16-lb. unit makes it possible to obtain accurate subsurface information without drilling and blasting. Two men can operate the equipment which can be handled easily on any terrain. Prospecting can be often done at a rate of ¾ mile a day, and the information obtained in this short time is often well worth the cost of the instrument.

Seismic impulses are produced with a sledge hammer. An electronic circuit in the instrument measures the time for sound waves to reflect from the strata below. Depth and types of material are determined with readings from the instrument; reading intervals are normally 200 ft. apart. Readings can determine the depth to bedrock, presence or absence of rock and other solid formations as well as accurate identification of subsurface materials. *Geophysical Specialties Co., 15409 Robinwood Dr., Hopkins, Minn.*

Enter 100 on Reader Card

Tractor control

A NEW "PILOT-TOUCH" CONTROL for crawler tractors makes it a simple job to operate these units. The single-stick control actuates hydraulic valves to perform all the necessary steps of clutching, braking, steering and forward or reverse travel. With the new control the operator merely selects travel speed and then starts travel with operation of the single control stick. Its slightest movement brings the proper valves into action to produce the desired motion in the machine.

The maker states that operator fatigue is greatly reduced and work cycles speeded up. Net result is greatly improved production. *John Deere Industrial Div., Moline, Ill.*

Enter 101 on Reader Card

Miniature switch

CONTROL INSTRUMENTS have been getting smaller and more compact during the last few years, apparently with no loss in accuracy or sensitivity. But a new pressure switch in a stainless steel housing is so small that its maker calls it "sub-miniature."

This little instrument weighs about an ounce and takes about 1 cu. in. of space, yet it is adjustable to pressures up to 200 psi. under vibration and shock conditions. The pressure setting adjustment is positive and simple even under the worst operating conditions. *The Bristol Co., Waterbury, Connecticut.*

Enter 102 on Reader Card

Portable dust sampler

PORTABLE, LOW COST dust-sampling is now available to rock products producers who wish to maintain an accurate, reliable record of air-borne dusts in and around their plants. This 21-lb. instrument can automatically collect up to 900 air samples.

Each individual dust sample is sucked into a sealed sampling chamber with a 1/50 hp. pump, passing through a paper filtering tape. Dust concentration is measured by a densitometer. Filtering time for each sample can range from 5 to 120 min. while the volume of air used to prepare the sample can be adjusted between 1.5 and 36 cu. ft. The paper tape is advanced automatically after each sample. *Gelman Instrument Co., Chelsea, Wis.*

Enter 103 on Reader Card

Hydraulic takeup—progress for conveyor belts

SCREW TAKEUPS may become obsolete on belt conveyors with the development of hydraulic tensioning devices. One of these, known as the Hydraligner, is said to provide both proper tension and correct alignment of belts on conveyors faster and safter than conventional screw takeups.

The new unit is adaptable to remote control through hydraulic lines. When used in this way it eliminates workmen going to inaccessible, remote or hazardous locations to make conveyor adjustments.

Normal adjustment of the new unit is made with the pressure applied with a conventional grease gun. The adjustment is maintained with positive action piston seals. Since the adjustment is made while the belt conveyor is operating, the belt tension and alignment can be observed under load.

The hydraulic piston is mounted on a steel take-up frame. A heavy duty, self-aligning anti-friction takeup unit is available in sizes ranging from 1 15/16 through 3 7/16 in., covering the large majority of takeup pulley installations. Four standard adjustments are offered—14, 18, 24 and 36 in. This new unit is standard equipment on this manufacturers conveying equipment, but it can be readily assembled on existing conveyors. *Western Conveyor Co., P. O. Box 357, Boise, Idaho.*

Enter 104 on Reader Card

Big speed reducers

AS THE POWER REQUIREMENTS of the big machinery grow, so must the component parts of the drives. To meet the need for a bigger speed reducer, this manufacturer has developed a line of quadruple-reduction helical reducers. Reduction ratios are available from 106:1 to 650:1 at ratings up to 815 hp. and are designed to meet the most severe overhung load and shock loading conditions.

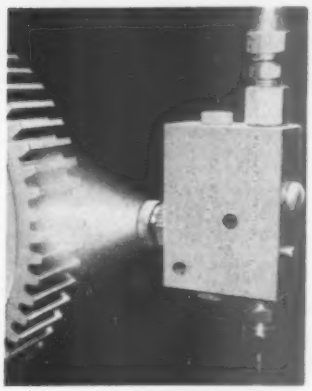
Precision grinding of the helical gears assures the accuracy and smooth finish of the tooth profile, resulting in minimum noise, reduced vibration and controlled backlash. The reducers thus have improved life, higher load ratings and lower operating temperatures. Splash or pressure lubrication is available. *Philadelphia Gear Corp., 3620 G St., Philadelphia 34, Pa.*

Enter 105 on Reader Card

Automatic lube valve

A NEW SPRAY VALVE is offered which can spray any oil or grease suitable for pumping on open gears, trunnions or other machinery. The new valve can be simply added to existing centralized lubricating systems already planned for gear lubrication or it can be adapted to other systems.

Unusual design of the valve requires no adjustment of spring tension to suit varying conditions of lubricant viscosity or temperature, according to the manufacturer. The valve needs only 15 to 20 lb. air pressure to give



best spray results. Air supply is shut off when lubricant feed stops, giving savings in lubricant and air pressure.

The new valve is easily installed in air and lube lines, and there is no restriction in size or length of lines coming to the valve. Spray nozzles with flat pattern or cone pattern spray can be supplied to meet the needs of each installation. *Trabon Engineering Corp., 28815 Aurora Rd., Solon, Ohio.*

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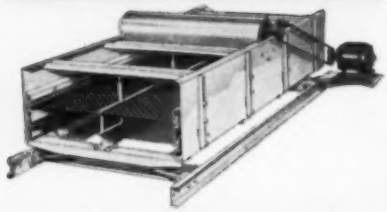
(Continued on page 198)

FOR PROFITABLE SCREENING USE
UNIVERSALS



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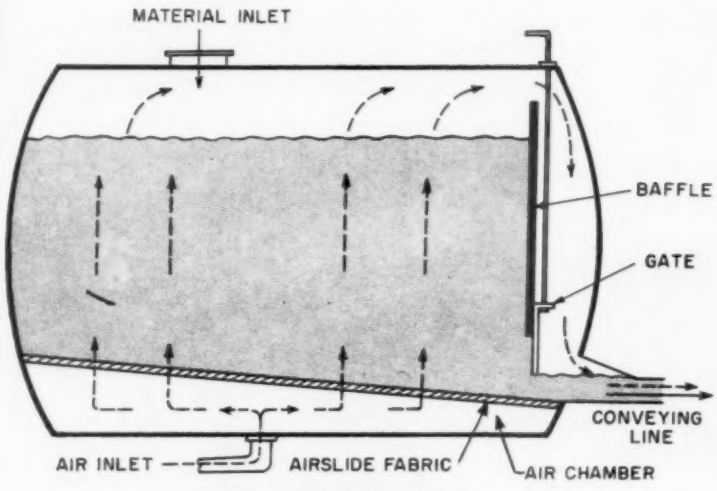
(Continued from page 197)



AIRSLIDE PUMP UNIT

Low-pressure tank feeds pneumatic conveyor

A NEWLY DEVELOPED low-pressure tank feeds bulk materials into a pneumatic conveyor line. Of lightweight construction, the new Airslide Pump can easily be mounted on a truck, trailer or skids to serve as a mobile, self-discharging bulk carrier. A single source of air provides pressure for the entire operation, unloading, feeding and conveying.

Material in the tank is supported on one or more conventional Airslides. But the rate of flow is controlled by a regulating gate. As air mixes with the metered material, the mass passes through the discharge opening into the conveying pipe. The installation of this airslide pump is not regulated by the codes covering pressure vessels since opreating pressure is below 15 psig. *Fuller Co., Catasauqua, Pa.*

Enter 107 on Reader Card

New front end loader has 9000 lb. capacity

THE MANUFACTURER has extended his line of tractor shovels to include a 9,000-lb. capacity, 4-wheel drive unit. The new W-12 Terraload'r unit has been patterned after other popular models in the line.

Control of the 2½-cu. yd. bucket is completely hydraulic and permits fast lifting and dumping cycles. Other features include power shifting, steering and braking. A constant mesh transmisison permits speeds up to 23 mph. through three speed ranges. *J. I. Case Co., Racine, Wis.*

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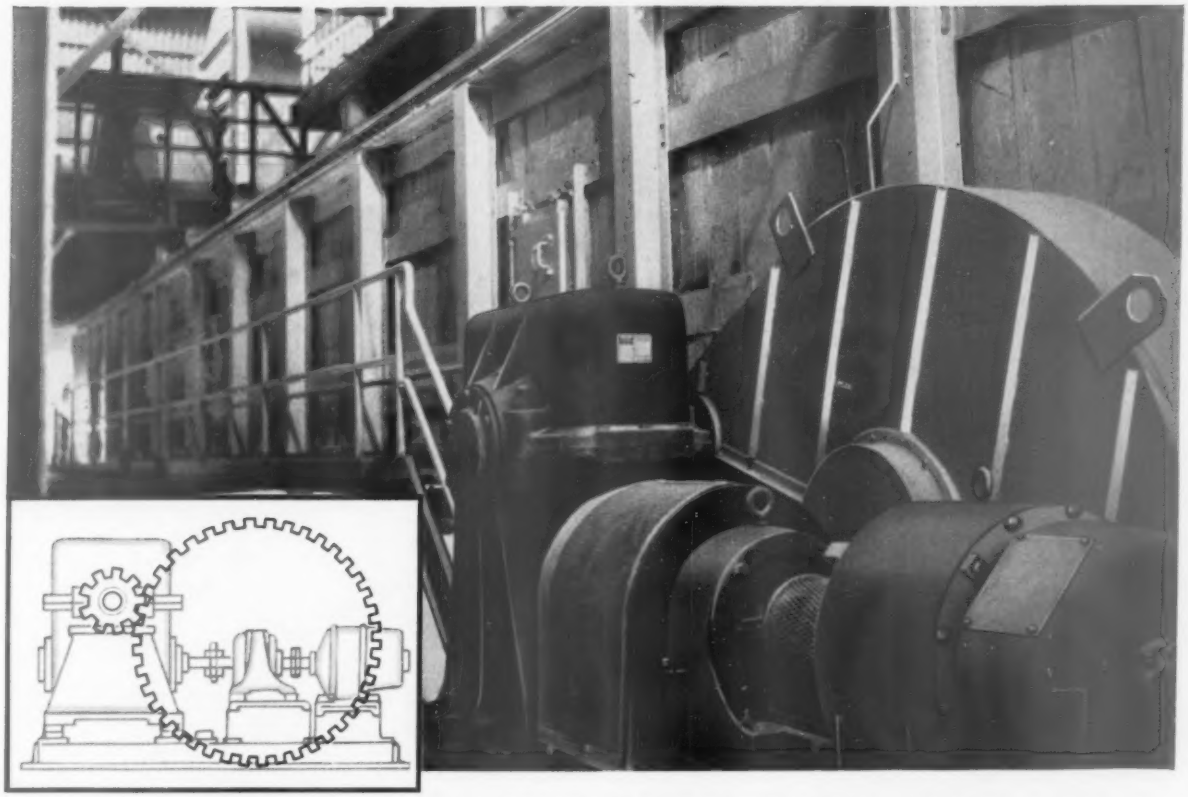
(Continued on page 200)

Foote Bros. Drives In The Cement Industry



Team of Reducers GIVES PERFORMANCE PLUS Driving Marquette Cement's ACL Grate

Two Foote Bros. Reducers team up to provide a powerful, close-coupled drive for the ACL Chain Grate used in Marquette Cement Company's ultra-modern Milwaukee plant.

Dependable power—and plenty of it—was required to drive the head shaft of the 82 ft. long x 12½ ft. wide furnace grate which moves pelletized raw material through the drying and preburning chambers.

Problem: In a limited space, provide a right angle drive capable of delivering a final torque of 1,400,000 in. lbs. at the head shaft of the grate.

Solution: To provide the necessary reduction from a 20 HP variable speed motor, a Foote Bros. 224 SL concentric shaft Reducer was coupled to an 18 S Right Angle Worm Gear Reducer which drives a large spur gear set to turn the grate.

The smooth, steady, and positive grate travel provided by the team of Foote Bros. Reducers, is an important requirement of the carefully balanced Marquette process. Since going into service almost two years ago, the Drives have met every requirement of Marquette's design and production engineers for "no downtime" performance.

There's a Foote Bros. Drive made to meet your power transmission requirements. Ask your nearby Foote Bros. Authorized Distributor for information or assistance concerning your power transmission problems. He's ready to help you.

FOOTE BROS. F B **GEAR AND MACHINE CORPORATION**

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POWER TRANSMISSION DRIVES

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MASTER MECHANICS CORNER:

Karl Wernle, Master Mechanic in charge of 250 machines for McDougal-Hartmann Co., Peoria, Illinois, working on Illinois Interstate Highway Rt. 74 at Peoria, Ill.

"Most bolts and nuts don't seem to hold our equipment together when the going's rough. We've found Cat bolts and nuts do."

Caterpillar Tractor Co., General Offices, Peoria, Ill., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

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TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal —no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300% —special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

• Open Gears, Dipper Sticks, Cams • Enclosed Gear Cases • Wire Rope and Cable
• Hydraulic Units, Torque Converters • Roller, Ball, and Sleeve Bearings • Speed Reducers

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(Continued from page 198)

Load switch

AS AUTOMATIC OPERATION of machinery becomes more common in the rock products industry, more attention will be paid to the controls which will do the actual work. One of the most important of these is a control which will sense changes in weight. A newly developed load switch, known as the Dyna-Switch, is offered for the heavy duty common in many processing operations in the industry.

The new switch is simply a U-shaped beam which supports a hopper or other container holding the material to be measured. As the beam deflects under load, it operates contacts to open or close circuits to motors or other instruments. Individual switches have capacities up to 20,000 lb. Each is enclosed in a vapor-tight metal housing, suitable for outdoor or dusty conditions. *W. C. Dillon & Co., Inc., 14620 Keswick St., Van Nuys, Calif.*

Enter 109 on Reader Card

Cement haulers

NEWEST DEVELOPMENT in cement hauling is aluminum "cans" mounted on high-trailer frames. The lightweight, high-capacity bulk trailers have been designed especially for Western operation where weight, length and clearance restrictions are more liberal than elsewhere in the country. Standard units have 510 cu. ft. capacity but larger units can be fabricated.

Standard openings in the top dovetail with most bulk-loading chutes while standard discharge openings make unloading quicker and easier. The bottoms are equipped with 26-in. butterfly gates for quick unloading. Each standard unit can be easily converted to an aggregate carrier, if necessary. *Fruehauf Trailer Co., 10942 Harper Ave., Detroit 26, Mich.*

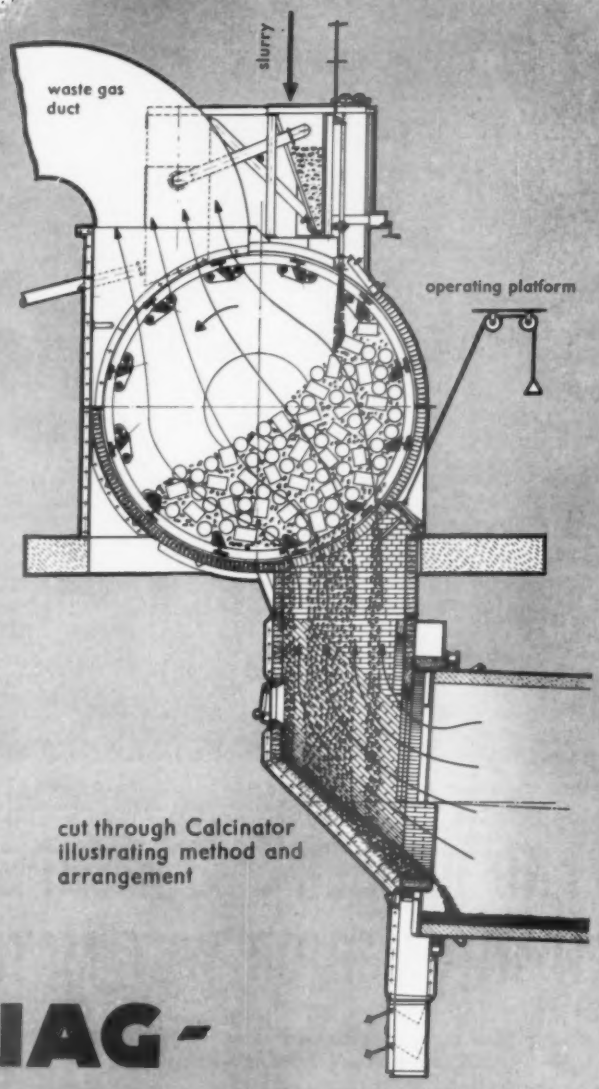
Enter 110 on Reader Card

Paper bag sealer

CEMENT PLANT, lime and plaster producers who use multiwall pasted valve bags can be assured of tight durable sealing with a new bag sleeve. The Crown Cuffed Tuck-In Sleeve is expected to greatly increase bag closing operations.

The sleeve for flush-cut or stepped-end pasted bags is turned back at the insert end to provide a double thick-

(Continued on page 203)



cut through Calcinator illustrating method and arrangement

Calcinator Installation for 7200 bbl/day

Calcinator for a wet process 3600 bbl kiln pre-assembled in factory

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the pre-heater for wet process kilns reduces fuel consumption, increases capacity

Grate drum of Calcinator for 3600 bbl capacity being assembled

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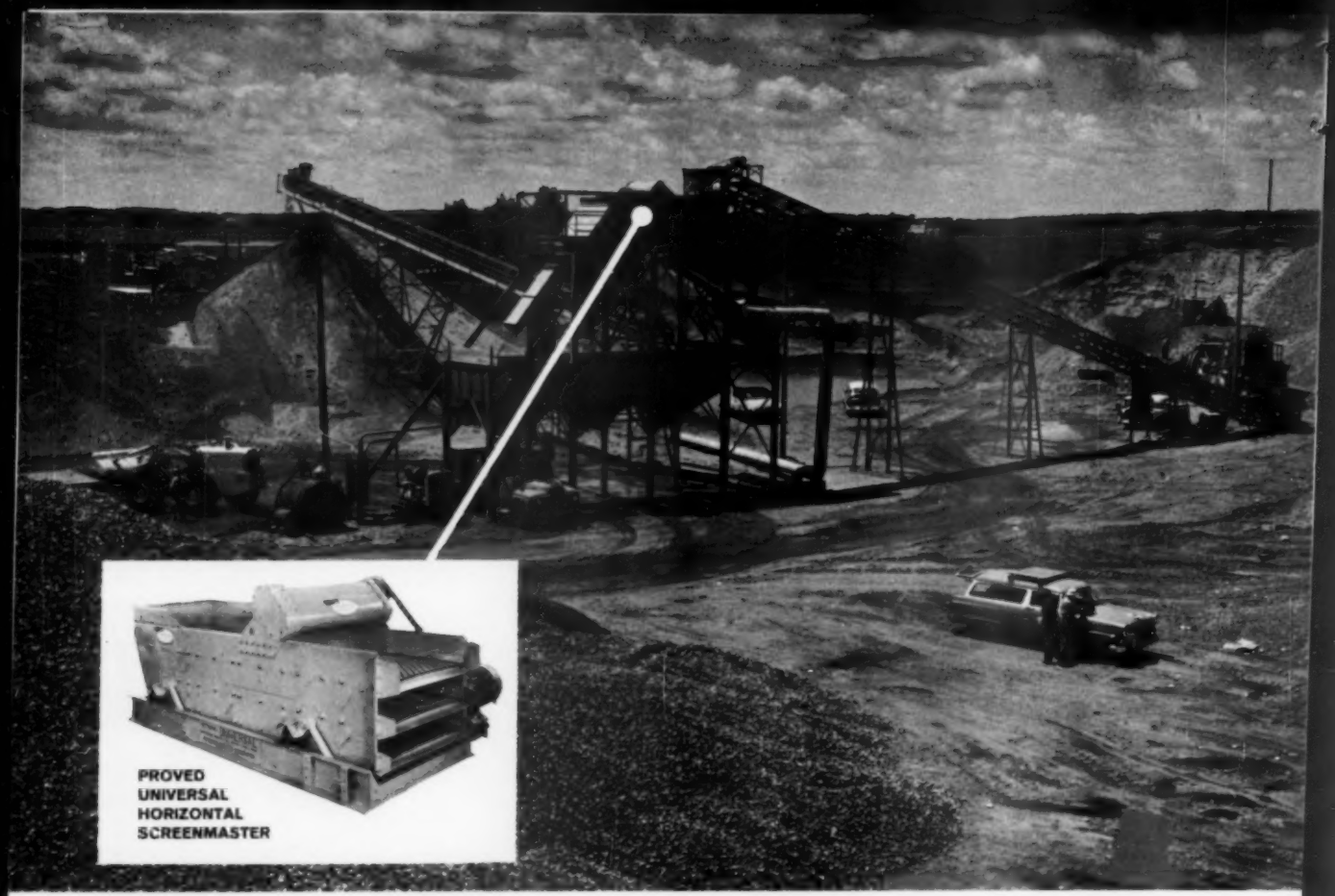

Universal's Screenmaster working in the Barton Construction Co. pit near Rosemont, Minn. As a result of its outstanding performance in sizing material for their various paving jobs, Barton recently purchased a Universal Portable Crushing Plant equipped with a Universal Low-Boy Screenmaster.

FLOATS ON AIR AND RUBBER . . . A SUPERIOR PERFORMER EVEN IN DAMP OR WET MATERIAL

A proved combination of air springs and rubber-bushed phasing bars has made Universal's Screenmaster the standard for profitable production. Owners and those who have seen it in action call it the most efficient screen developed in years.

Its exclusive features combine to give the Screenmaster the most aggressive screening, the most positive separation, the lowest maintenance and the greatest capacities ever.

The screen, with its exclusive air springs and rubber-bushed phasing bars, acts as a single unit, transmits smooth, sharp and aggressive action over the entire screening area. *The air springs* replace conventional coil springs . . . cushion and absorb shock while *the phasing bars* control the screen, eliminate the destructive, corner to corner violence of ordinary screens.

Snappy aggressiveness produced by this exclusive combination, prevents blinding, blanketing or squatting. . . cuts through wet or damp material quickly — resulting in greater capacity and higher profit. The Universal Screenmaster also gives you more screening area. Its rugged feed box absorbs and distributes material over full width of screen deck; a precision engineered power unit gives you long trouble-free life.

Put this profit-making Universal Screenmaster to work for you. There's a size for every requirement. Your Universal Distributor can help select the best for your operation whether stationary or portable.

Eliminates Leaf and Coil Springs

The Screenmaster floats on air and rubber. Gone completely are the old metal leaf and coil springs. And with them. . . their destructive violence. . . their unpredictable reaction to loads . . . their unnecessary wear on basket and cloth. . . their high cost of continuous replacement!

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UNIVERSAL ENGINEERING CORPORATION

617 C Avenue N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

(Continued from page 200)

ness about 1½ in. wide. When this is glued, a flat, securely-held sift-proof enclosure is assured. The increased tuck-in surface and double-thickness gives snug sealing of the sleeve end into the cuff pocket and eliminates the possibility of breaking the glue-bond during closure. *Crown Zellerbach Corp., Multiwall Bag Sales Div., 343 Sansome St., San Francisco, Calif.*

Enter 111 on Reader Card

New compressor

A NEWLY DEVELOPED single-stage compressor will deliver a full 600 cfm. of compressed air at 100 psi. at 10,000 ft. altitude. This performance is possible with a number of features offered by the maker, including a turbocharged diesel engine which apparently puts out 25 percent more power than other engines of similar size. This engine operates at 1,200 rpm., resulting in reduced wear and lower maintenance expense.

Engine and compressor are connected with a manually operated clutch to let the engine reach operating temperature under no-load conditions. Also standard on the unit is a governor which regulates the speed of the unit in proportion to the compressed air demand. But even with new features and increased efficiency, the manufacturer offers the new unit at prices below units of similar capacity. *Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa.*

Enter 112 on Reader Card

Big haulage trucks

A SERIES of three big off-highway trucks has been announced for heavy duty service. All three units have standard front axles, five-speed transmissions, double-channel frames of heat treated chrome manganese steel and a range of engines and rear axle construction to meet an operator's special needs.

One unit has standard diesel power ranging up to 220 hp. and a single rear axle. The other units have gasoline engines up to 215 hp. and either single or tandem rear axles. However, the manufacturer's Unit-Option plan lets the operator select the most advantageous combination of chassis, engine, transmission and axle combination for his particular requirements. *The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio*

Enter 113 on Reader Card

Plastic bearing

WHEN FRICTION-TYPE BEARINGS prove to be inadequate for conditions of heavy loads, and wet, dusty or abrasive atmospheres, plastic bearings may prove to be a satisfactory improvement. Roll-Dri, a new laminated plastic bearing liner has been substituted successfully in wet locations which had flushed out grease from other bearings. The new bearing needs no lubricant to work successfully, and can stand up under high heat of friction. Plastic bearings have worked where grease or oil would not stay on the journal surface. *Industrial Plastic Supply Div., 574 New Park Ave., West Hartford 10, Conn.*

Enter 114 on Reader Card

All-steel reducer

A BIG NEW UNIT has been added to this manufacturer's line of motorized, all-steel helical speed reducers. Designated as size 8-E, it extends the line's capacity to a range of greater horsepowers and lower output speeds. Now

(Continued on page 204)

WET BLAST HOLES?

switch to BEMIS EXPLOSIVES BAGS

With the trend to economical ammonium nitrate mixtures* for blasting, wet holes are a frequent problem.

But there is a complete and economical solution:

Bemis EXPLOSIVES Bags . . . made of three plies of creped wet-strength kraft for toughness . . . and Bemis-extruded, pinhole-free poly tubing for waterproofness.

You can drop them freely in holes up to 65 feet deep . . . 6 inches of water in the hole is a sufficient cushion. Leave them for a week before shooting . . . let 30 feet of water accumulate . . . it's all the same to Bemis EXPLOSIVES Bags.

Bag sealing? Takes only 6 or 7 seconds with a Bemis Tom Thumb Heat Sealer costing just $120.

Jagged holes? You may want to use the extra-protective Bemis burlap explosives bag with poly liner. It's a brute for punishment. And still economical.

Write or phone for complete information and a sample bag.

* Wide experience shows ammonium nitrate mixtures packed in Bemis EXPLOSIVES Bags reduce explosives costs by as much as 50 percent.

BEMIS *Where flexible packaging ideas are born*

General Offices —
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STEP UP PRODUCTION . . . PROLONG EFFECTIVE SCREEN LIFE

with Hanco ELECTRIC SCREEN HEATERS

- QUICK, EASY INSTALLATION
- TROUBLE-FREE OPERATION
- DUST PROOF
- LOW MAINTENANCE COSTS
- ADAPTABLE TO ALL SCREENS

START achieving maximum screening efficiency and continuous high tonnage production by installing proven HANCO SCREEN HEATERS which

STOP screen cloth blinding, costly shutdowns, screen damage and too-frequent replacement due to abusive mechanical screen-cleaning methods.

HANCO ENGINEERS will promptly analyze your requirements and make recommendations for more profitable screening of your products.

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ANALYZE FOR Na_2O or K_2O WITH ACCURACY IN ONE MINUTE

In analyses for alkalies, such as sodium and potassium oxides under ASTM Spec. C114-51T, the Perkin-Elmer Model 146 Flame Photometer delivers reliable results. Internal standard or direct-intensity reading from AC drift-free electronics gives fast routine analyses, accurate to within one percent.

The Model 146 operates with any commercially-available gas and air, is designed for simplified, convenient operation. It uses regular electric utilities, and includes rugged self-contained meter and phototube circuits.

Write for Perkin-Elmer's illustrated brochure on the Model 146 Flame Photometer.

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INSTRUMENT DIVISION

Perkin-Elmer Corporation

NORWALK, CONNECTICUT

NEW MACHINERY

(Continued from page 203)

available are 75-hp. drives with output speeds as low as 56 rpm. with a full range of intermediate ratings down to 1 hp. at 1 rpm.

The new units have greatly increased overhung load ratings over the largest units previously offered. These ratings range from 6,200 lb. at 350 rpm. output speed of the low speed shaft to 14,000 lb. at 30 rpm. and under, giving plenty of capacity for heavy loads at low speeds. *The Falk Corp., Milwaukee 1, Wis.*

Enter 115 on Reader Card

Grease gun

A GREASE GUN in a holster will make it easier for the maintenance man to service equipment. Grease gun is a lever-type gun that provides either high pressure or volume delivery of lubricant; a simple latch pin selects the method. Pressure up to 10,000 psi. can be obtained at the high-pressure setting and full pressure can be reached with a stroke as small as ¼ in., according to the maker. The new gun is fitted with a nozzle extension that swivels 360 deg., and is of all-steel construction with nickel-plated satin finish.

The holster holds the new gun, or any 2¼ in. diam. gun, and two standard 14½ oz. refill cartridges. The compact, one-piece assembly can be bolted easily to any piece of equipment. *Lincoln Engineering Co., St. Louis 20, Mo.*

Enter 116 on Reader Card

New compressor

A NEW ROTARY AIR COMPRESSOR is available which delivers 900 cfm. of 100 psi. air with an engine speed of 1,700 rpm. This speed reduction in the diesel engine results in more air per pound of fuel consumed than other makes, according to the maker.

Air pressure is controlled closely with automatic regulation of the engine and compressor at all air demands. Engine modulation is smooth and stepless to prevent racing. Standard equipment includes a two-pass muffler automatic blow-down valve, swing type check valve and other features which add to the unit's efficiency and low operating costs. *The Jaeger Machine Co., Columbus 16, Ohio*

Enter 117 on Reader Card

(Continued on page 206)

"My Boss Read the Specs with Tears in His Eyes"

He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

If you're in this business, Brother, it might pay you to have a good long look at what a Sturtevant can do for tight aggregate specifications.

Sturtevant Air Separators classify production loads up to 150 tph by exact control of air currents and centrifugal force. Simple, quick adjustments make possible the selection (or rejection) of particles in the 30 to 400 mesh range. Nine standard models available, varying in size from 3′ to 18′.

Learn how a Sturtevant Air Separator can help your aggregates production. Write today describing your needs. Address: Sturtevant Mill Co., 102 Clayton St., Boston 22, Mass.

STURTEVANT AIR SEPARATORS CLASSIFY SAND WITHOUT WATER

PRODUCING CLEAN SAND, the Sturtevant acts as a de-duster by removing fine mesh particles from the throughput. Particularly valuable where water is limited.

EASING SCREEN LOADS, the Sturtevant rejects unwanted fines and circuits coarser sizes to screens for grading. By this pre-classification, the possibility of blinding screens with fines is minimized and output considerably increased. Also, excessive dust problems are eliminated.

WHEN BLENDING IS NECESSARY, the Sturtevant selects fines from the crushing operation. This stockpiled product then can be used in the blending operation to overcome fineness modulus deficiencies.

GRINDERS
CRUSHERS
PULVERIZERS
MICRON-GRINDERS

STURTEVANT MILL CO.

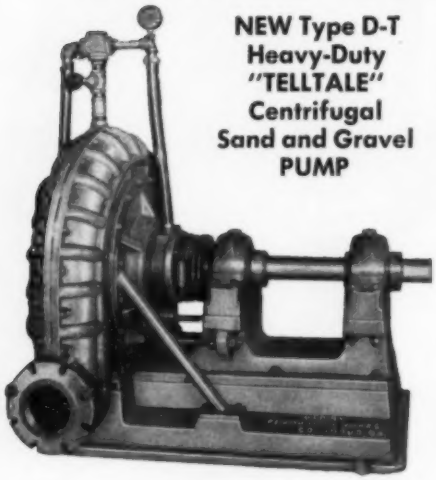
Dry Processing Equipment

The "OPEN-DOOR" to *lower* operating costs over *more* years

MIXERS
BLENDERS
ELEVATORS
AIR SEPARATORS

Enter 1046 on Reader Card

ONLY "TELLTALE" PUMPS WARN WHEN IT'S TIME TO RELINE



NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

No time-wasting look-see at the pump's insides necessary. Water leaking through the ports between the bolted halves of the outer shell tell the tale of a shell liner worn through.

When the shell liner wears through, sand and gravel quickly eat through the rope-type packing between shell liner and the shell. Hence the telltale leak.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

The useful and exclusive telltale feature is one of all the best retained in the latest "Telltale" pump, only type we now manufacture.

Some new features: New highs in production—new lows in downtime, because of simple foolproof assembly for changing parts—also "Telltale's" own.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

PEKOR IRON WORKS, INC.

ESTABLISHED 1892

LOCK DRAWER 909 FAIRFAX 2-4020 COLUMBUS, GEORGIA

Enter 1092 on Reader Card

MEMO

To PRODUCERS

Just checking . . . . have you noticed the advertisements which apply to your operation?

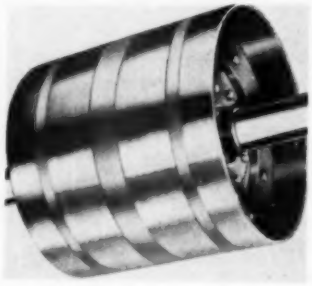
ROCK PRODUCTS' Advertisers regularly keep you well informed concerning both new equipment and processes.

Why not glance through this issue again to make sure nothing of importance to your business has missed your attention.

(Continued from page 204)

Magnetic pulley

MAGNETIC PULLEYS at the head or drive end of belt conveyors have long been recognized as highly desirable by most rock products producers. However, the relatively higher cost of large diameter pulleys have tended to discourage extensive use on long, heavily-loaded belt conveyors. This manufacturer claims to have solved this problem with the introduction of a low-cost, heavy duty, permanent magnet type belt conveyor pulley to remove tramp iron from bulk materials on the conveyor.



The new pulleys are available in 30, 36, 42 and 48-in. pulleys—sizes frequently specified for the largest belt conveyors. Low cost is achieved with the use of Indox V, a highly oriented barium ferrite ceramic material. This compound is said to be equal to the most powerful electromagnetic pulley, without the coils, rectifiers and contactors necessary for this kind of pulley. *Stearns Magnetic Products, 635 So. 28th, Milwaukee, Wis.*

Enter 118 on Reader Card

Batch weighing system

A NEW BATCH-WEIGHING SYSTEM incorporates a bonded strain gauge load cell as the sensing element. This new electric batch weighing system is adaptable to metering out bulk cement, lime, sand and aggregates.

Since the conventional springs, levers and bearings are eliminated, greater accuracy and flexibility is available for weighing and batching. The unit is supplied for either manual or automatic operation. Load cells are enclosed and sealed to make them suitable for operation in wet or dusty locations. *Gilmore Industries, Inc., 13015 Woodland Ave., Cleveland, Ohio*

Enter 119 on Reader Card

(Continued on page 208)

Enter 1093 on Reader Card

Do you want low price or low cost?

Here's the real difference between Crane-Excavator profit and loss . . .

There isn't a machine built today that won't have some problems — because no two operators or jobs are alike . . . because occasionally every operator may abuse the daylights out of a machine . . . because no completely indestructible materials have yet been found.

The key to maximum *machine availability* lies in what the manufacturer does before the machine goes to work; how he designs and builds machines to cope with these problems.

"Destruction" testing to make machines better!

To find out what machines will do, it is necessary to find out what they won't do! Bucyrus-Erie engineers working on booms, for example, literally cover a boom with strain gauges — fine wire sections so delicate many are broken in ordinary handling — to find out exactly where the strains occur and how severe they are. They lift weights so far beyond capacity booms are forced to buckle. They tug away at the boom with tractors to check side loading factors of safety. Finally the material will stand no more.

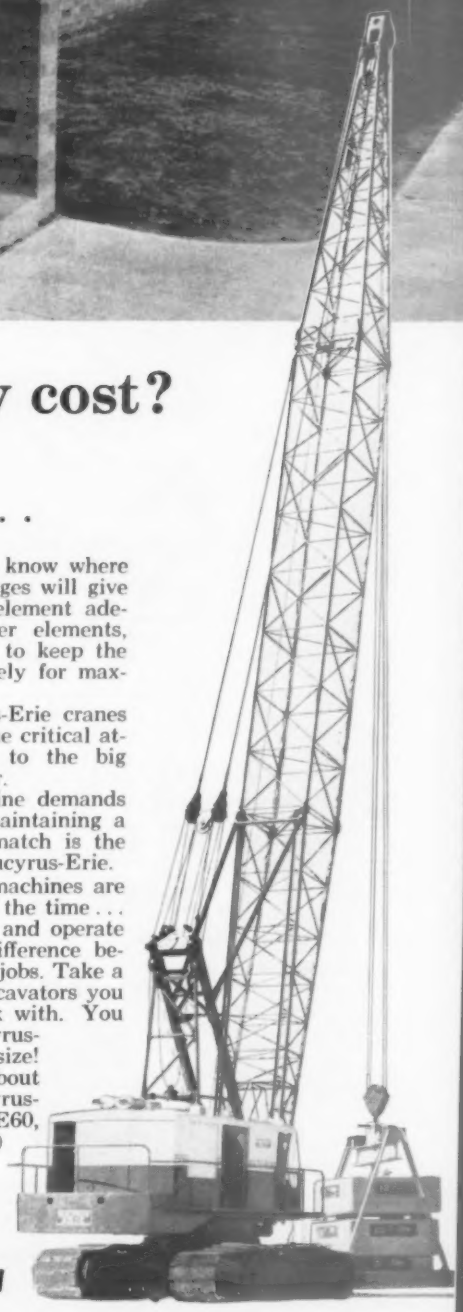
At this point the engineers know where to start over again, what changes will give you a boom in which each element adequately complements all other elements, what strengthening is needed to keep the machine working steadily, safely for maximum profit.

The other parts of Bucyrus-Erie cranes and excavators receive the same critical attention from drawing board to the big Bucyrus-Erie Research Center.

Because jobs change, machine demands change, and the process of maintaining a high standard of quality to match is the daily work of engineers at Bucyrus-Erie.

That is why Bucyrus-Erie machines are available and working more of the time . . . why they are low-cost to own and operate . . . why they make the big difference between profit and loss on many jobs. Take a long look at the cranes and excavators you have to live with — and work with. You can't buy better than a Bucyrus-Erie machine, whatever the size!

(For detailed information about any size or model, write Bucyrus-Erie Company, Department 10E60, South Milwaukee, Wisconsin.)

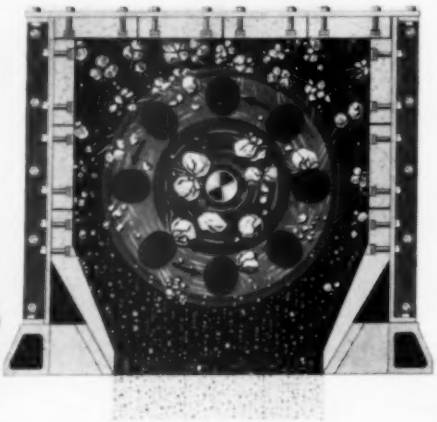


BUCYRUS ERIE® . . . *most respected name in the field*

SIZE AND UPGRADE

YOUR AGGREGATES FOR BOTH CONCRETE AND BITUMINOUS MIX WITH

STEDMAN CAGE MILL



The Stedman Single-Cage Mill reduces Gravel and Stone, either wet or dry, via the Internal-Impact Principle. See cut above. It pulverizes unsound material to be passed off with fines—the discharged product going to wet screens, log washer, jigs, or heavy media process.

The Stedman Single-Cage Mill not only upgrades your product, but also gives the greatest percent of crushed surfaces for Black Top Mix. Example: "Crush your—2"+¼" including pea gravel to a product of ⅜" X O, screen out minus ¼" sand and furnish a specification product for Bituminous Mix with 65 to 100% crushed particles."

Variation of speeds and type of cage result in a wide variety of product sizes. Wire or write for information.

STEDMAN FOUNDRY AND MACHINE COMPANY, INC.
Subsidiary of United Engineering and Foundry Company
AURORA, INDIANA, U. S. A.

Enter 1072 on Reader Card

HYDRAULIC CLASSIFICATION *BEATS SCREENING FOR ECONOMY AND PERFORMANCE*

The CONCENCO® CPC Classifier simultaneously produces sharp classification of -¼" sand into ten or more sizes . . . into as many sizes as there are cells in the classifier . . . one size for each cell. The required operating settings for desired products are quickly and easily made while observing visually the classifying results within each cell. It operates by hydraulic water power only. There are no moving parts. Send for full information.

Made by the Original Deister Co.
Incorporated 1906

The DEISTER CONCENTRATOR COMPANY, INC.
915 Glasgow Avenue — Fort Wayne, Indiana

Enter 1073 on Reader Card

GILSON

TESTING SCREEN

A proven profit maker. Controls and guarantees your product. Fast, accurate, trouble-free.

For sizing test samples of crushed stone, sand and gravel, slag and similar materials in a size range from 4-in. to 200-mesh.

GILSON TESTING SCREEN
with motor, dustpan tray and 5 coarse series screen trays..$500 FOB Malinta, Ohio
Shipping Weight.....500 lbs.

Write for complete GILSON catalog

SAMPLE SPLITTER

Reduces large samples for convenient testing. Adjusts for all materials, sand to heavy aggregate. Simple to use. Heavy welded steel construction.

SAMPLE SPLITTER
complete with two material pans and bag-loading chute..$125 FOB Malinta, Ohio
Shipping Weight, crated.....195 lbs.

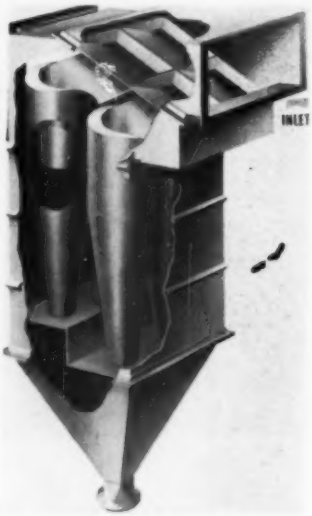
GILSON SCREEN CO.
MALINTA, OHIO

Enter 1074 on Reader Card

(Continued from page 206)

Dust collector

IN THE DESIGN of this new cyclone dust collector, cyclone tubes are mounted between inlet and discharge sheets. The tubes are surrounded by



cleaned gases and are maintained at a high enough operating temperature to reduce or eliminate condensation, according to the manufacturer.

This new "1600" cyclone collector is offered for applications that do not require the ultra-high efficiency offered by other cyclones in this maker's line. Yet it gives good efficiencies to collect a number of nuisance dusts or fine products at reasonable investment. *Dustex Corp., P.O. Box 2520, Buffalo 25, N.Y.*

Enter 120 on Reader Card

New belt wiper

HOW TO KEEP conveyor belts clean is a major problem for most rock products producers. While conveyor manufacturers have been keenly aware of the need, few belt wipers have performed successfully under all conditions with all materials.

This manufacturer has developed a spring-type belt cleaner which has demonstrated great success over a testing period of several years. With this new design, a number of steel wiper blades are held in position against the conveyor belt with spring steel arms. The blades are set perpendicular to the belt surface, but since each blade is

(Continued on page 210)

THIS GOOD LIFE

means more business for you

If you're a man who knows how to get ahead (and stay ahead) in business, you read your businesspaper carefully. Advertising as well as editorial pages. Why? Because—as a man who gets a kick out of doing a top job—you know the best place to get good practical ideas you can put to work with extra profit to yourself, and your firm, is your businesspaper. It is from your life's work that come the means to all other satisfactions in life . . . from indulging in marriage when you are young to financing a hobby when you are old. That's why businesspaper advertising helps you and your family enjoy the Good Life which makes America great.

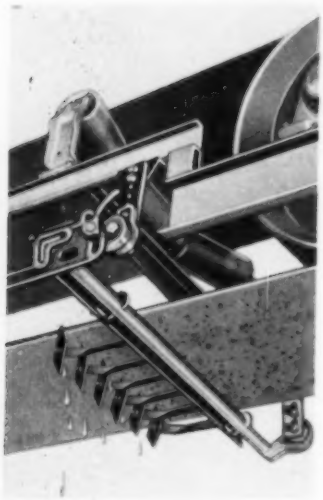
Advertising helps you enjoy the good life

ROCK PRODUCTS

MACLEAN-HUNTER PUBLISHING CORPORATION

79 West Monroe Street—Chicago 3, Illinois

(Continued from page 208)



individually suspended, it acts independently of the others. Blade pressure against the belt is said to be low, eliminating belt wear and reducing the hazard of gouging or tearing the belt. *Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.*

Enter 121 on Reader Card

Aerosol lubricant

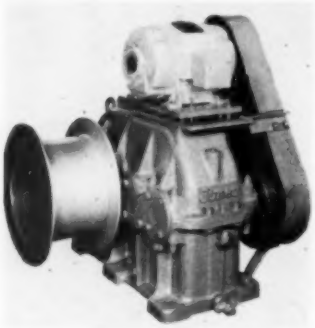
HEAVY-DUTY pressure-adhesive lubricant can now be applied without the mess and inconvenience usual when lubricating open gearing with heavy grease. Instead, this manufacturer offers a high-quality gear lubricant for this purpose packaged in handy aerosol containers. Each can hold enough grease to cover about 25 sq. ft. of area.

The spray method assures that all of the exposed area will be completely and uniformly covered with lubricant. Hard to reach areas can be covered with as much or as little lubricant as necessary. In addition to open gears, rock products producers will find the technique useful to put grease on chains, sprockets, wire rope, sheaves, cams and slide rails. *J. F. Withers Co., Box 116, Detroit 12, Mich.*

Enter 122 on Reader Card

Car spotter

THIS CAR SPOTTER can be operated by remote control without the immediate attention of an operator. This feature is possible since the wire rope is



dead-ended on the flanged drum. The rope is stored in the drum as it is wound up pulling a car; there is no rope slippage as the car is moved.

The drum is mounted on the output shaft of a totally enclosed herringbone speed reducer. A bracket on the reducer supports a 5 or 7½ hp. motor to suit power requirement, while the motor can be supplied to meet local electrical characteristics. Motor controls can be placed at the motor or in any remote location for safety or convenience of the operator. *Hewitt-Robins Inc., 666 Glenbrook Rd., Stamford, Conn.*

Enter 123 on Reader Card

Tractor shovel

A FOUR-WHEEL DRIVE tractor shovel with breakout capacity of 23,500 lb. has a standard loader bucket rated at 2½ cu. yd. The unit features a torque converter drive, power transfer differential for all four drive wheels. *J. I. Case Co., Racine, Wisconsin.*

Enter 124 on Reader Card

Crawler tractor

A TRANSMISSION that provides independent power to each track, controlling both speed and direction, is featured in this 62-hp. crawler tractor. It is powered by a 4-cylinder valve-in-head diesel engine. *Oliver Corp., 14300 Euclid Ave., Cleveland, Ohio.*

Enter 125 on Reader Card

Sideloading unit

A VERSATILE, electric-powered sideloading unit in 4,000 and 6,500-lb. capacities, equipped with twin crane booms, has been made available. The booms and forks have the same capacity and are arranged so that a load suspended from them is completely independent of the forks. *Baker Industrial Trucks, 8000 Baker Ave., Cleveland, Ohio.*

Enter 126 on Reader Card

New HINGED PLATEGRIP

Recommended for mines, quarries, construction work, storage yards—wherever belts length must be frequently changed. Hinged Plategrip Fasteners make a strong, flexible joint in heavy duty conveyor belts, trough naturally, ride smoothly over pulleys, yet can be separated by simply pulling the hinge pin. *Improved* design takes the new smaller diameter self-lubricating nylon sheathed cable hinge pins. No. 500X1 single bolt fasteners and No. 500X3 3 bolt fasteners (used at outside edges) to reinforce edges and aid troughing:

Write for Catalog

ARMSTRONG-BRAY & CO. 5386 NORTHWEST HIGHWAY CHICAGO, ILLINOIS

Enter 1094 on Reader Card

WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

See the **"WHERE TO BUY"** *Section*

Why the lady's ALLERGY suddenly vanished . . .

DOCTORS who treat allergy frequently encounter cases that have all the elements of good detective stories.

Consider, for example, the case of the housewife who had asthma and hay fever every summer. Strangely enough, her doctor found that pollens—which usually bring on these disorders—did *not* cause her trouble. Tests showed that she was sensitive to feathers, particularly those of the sparrow.

In tracking down clues to this case, it was discovered that outside the patient's bedroom was a vine in which many sparrows nested. When the vine was cut down and the sparrows departed—so did the patient's asthma!

Allergies may be caused by an almost endless number of substances which, to the average person, are entirely harmless. The person sensitive to one or more of them may develop skin rashes, sneezing attacks, digestive disturbances and other allergic reactions.

Most allergies are mild, and only occasional attacks occur. However, people highly sensitive to such substances as feathers, pollens, or dusts may have attacks so severe and persistent that both physical and mental health are affected. Whether the allergy is mild or severe, it is important to find the cause of the trouble.

In doing so, the doctor asks many detailed questions which may quickly reveal the trouble-maker. When and where do the attacks occur? What kind of furnishings are in the home? What chemicals or medicines were used recently? Are pets kept in the house? What foods have been eaten lately?

Allergies due to an obscure cause—or more than one cause—generally require detailed diagnostic studies, including simple skin tests. These usually reveal the cause of the allergic condition. Once found, complete relief may follow simply by avoiding the offending substance.

If treatment is necessary, the doctor will prescribe in accordance with the nature of the patient's sensitivities. Generally, a series of immunizing inoculations are given. These may greatly relieve allergic symptoms in over 4 out of 5 of the cases *provided patients maintain close and continued cooperation with the doctor.*

Whenever recurring and unexplained attacks of sneezing, itching eyes, skin eruptions, digestive upsets, headache, or "wheezy" breathing occur, medical attention should not be delayed. For early treatment brings best results—especially for "hay fever" and other seasonal allergies.

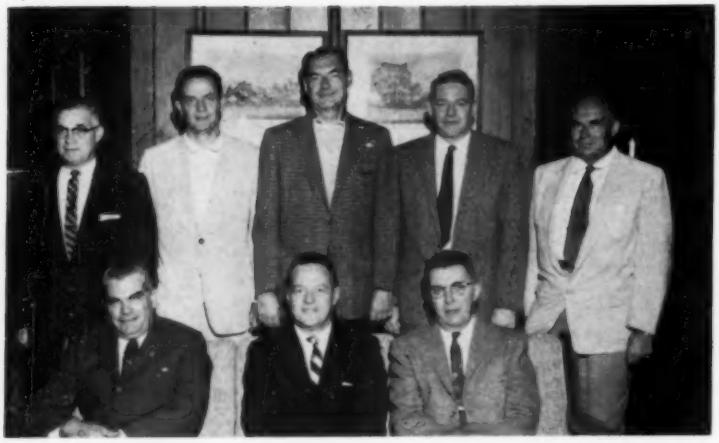
While medical science as yet has no "cure" for allergy, this disorder can usually be controlled and distressing symptoms greatly, if not entirely, relieved.

The plate for this advertisement has been supplied as a public service to the Allergy Foundation of America by the Metropolitan Life Insurance Company.

Allergy Foundation of America

801 SECOND AVE., NEW YORK 17, N. Y.

MANUFACTURERS NEWS



Conveyor makers group names new officers

CONVEYOR EQUIPMENT Manufacturers Association chose new officers and directors at a recent meeting at Point Clear, Ala. Elected at the group's 26th annual meeting were: front row, left to right, president, Orlan A. Johnson, president of Gifford-Wood Co., Hudson, N.Y.; retiring president, J. B. Nordholt, Jr., president of Webster Manufacturing, Inc., Tiffin, Ohio; re-elected vice president, E. H. Woodberry, manager of Industrial Products Division, Lamson Corp., Syracuse, New York.

In the back row, left to right, are: E. L. Weinthaler, vice president of Conveyor Systems, Inc., Morton Grove, Ill., a director; G. H. Woodland, vice president, marketing, of Chain Belt Co., Milwaukee, Wis., secretary; E. P. Berg, general manager of Pershing Road Plant, Link-Belt Co., Chicago, a past president who just completed his term as director; H. A. Barber, president of Barber-Greene Co., Aurora, Ill., treasurer, and R. C. Sollenberger, re-elected executive vice president to head the association staff.

Industrial Gas Cleaning Institute is formed

A NEW TRADE ORGANIZATION, the Industrial Gas Cleaning Institute, Inc., has been formed by leading makers of gas cleaning equipment. The nonprofit group has elected John T. Doyle, The Thermix Corp., as president.

Among its purposes: to promote the interests of makers of industrial gas cleaning equipment, to build interest among people in the manufacturing, engineering and public safety fields in the importance of gas cleaning, to improve testing practices and product quality, to collect and disseminate data on gas cleaning to the industry and the public.

Other officers are L. L. Andrus, Wheelabrator Corp., vice president, and John G. Liskow of American Air Filter Co., treasurer and temporary secretary. Other member firms are Aerotec Industries, Buell Engineering Co., The Ducon Co., Joy Manufacturing Co. (Western Precipitation Division), Kirk & Blum Manufacturing Co., Koppers Co., Northern Blower Co., National Dust Collector, Pangborn Corp., Pulverizing Machine Division, Peabody Engineering Corp., Research-Cottrell, Inc., Torit Manufacturing Co. and Green Fuel Economizer Co.

Case names Brinker executive vice president

JOHN H. BRINKER is new executive vice president of the J. I. Case Co., Racine, Wis., maker of construction and farm machinery. He had been vice president and general manager of the Permaglas Division of the A. O. Smith Corp., Milwaukee.

Under Mr. Brinker, Smith's Fiberglas Division experienced a sales gain of 45 percent in four years. He joins a company which has jumped from

sales of $87 million in 1956, to about $200 million this year (latter figure includes sales of former American Tractor Corp., which Case acquired in 1956). Case president Marc B. Rojtman called Mr. Brinker "one of the outstanding young industrialists of the United States." Mr. Brinker is 45.

Challenge, Cook Bros. announce merger

CHALLENGE-COOK BROS., a new corporation, was created with the recent merger of Challenge Mfg. Co. and Cook Bros. Equipment Co.

Challenge-Cook Bros. will maintain general offices at the former Cook Bros. location, 3334 San Fernando Rd., Los Angeles, Calif.

(Continued on page 214)

World's Longest Quarry Shovel Boom

This is a picture of the solution for an unusual problem—involving a 160-foot boom, the world's largest on a quarry shovel.

A "special," it typifies Marion's ability and willingness to go to unusual lengths to solve customer problems.

The machine is a Marion 5323 which carries an 11-yard dipper, 95-foot handle and 160-foot boom to deal with a rocky bank ranging up to 135 feet in height. This machine's ability to dump 326 feet away from the wall made it the ideal answer to this big quarry's problem.

Why not let Marion specialists take an imaginative look at your quarrying and mining needs?

CONSULT **MARION** MINING SPECIALISTS
for lowest costs on your property!

MARION POWER SHOVEL COMPANY • Marion, Ohio, U.S.A.

A Division of Universal Marion Corporation

(Continued from page 212)

Research Center opened by Fairbanks, Morse

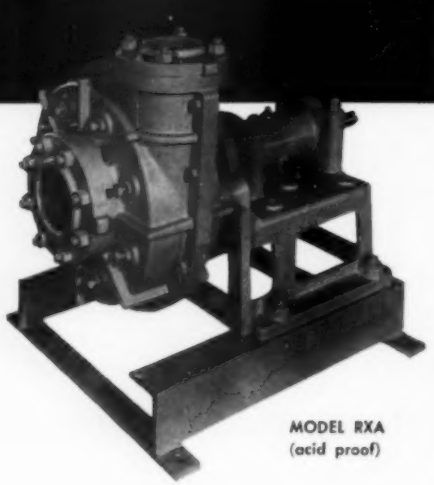
A NEW RESEARCH AND DEVELOPMENT CENTER at Beloit, Wis., has been opened by Fairbanks, Morse & Co. A 30 to 50-man staff will work with a development and research budget of $2.5 million this year, up from $1.5 million in 1959.

The Center, under director of engineering Walther C. Fischer, brings together under one staff product-development work formerly carried out by the development engineering staffs in the firm's eight factories. Also, the Center is headquarters for two other F-M research facilities—hydraulic testing and experimenting facilities at Kansas City, Kan., and the proposed thermo-electrical power research center in Albuquerque, N.M.

Two important past F-M research achievements are the opposed-piston diesel engine, which powered most U. S. Navy submarines in World War II, and the bladeless nonclog pump, now a standard item in many cities' sewage disposal systems.

NEW!

PERFORMANCE-PROVED CERAMIC-LINED SAND PUMP



MODEL RXA
(acid proof)

ARE YOU USING pumps for transferring fines? Is the volume in the range of 110′ head-150 GPM to 70′ head-600 GPM?

ARE YOU TIRED of replacing impellers, liners, shells, sleeves, seals, bearings, shafts, bolts, nuts, gaskets, etc., every few months?

ARE YOU WISHING someone would produce a pump worthy of your expectations? Something that would hold up for say — 14 months? 18 months? 2 years!

YOU WILL FIND the ultimate in wear resistance in ceramic lined pumps using silicon nitride bonded silicon carbide wear parts.

SOUND EXPENSIVE? Not at all. Cost is comparable to alloyed iron or rubber lined pumps.

For additional information on the new MODEL RXA Ceramic-Lined Sand Pump, write:

The KANSAS CITY HAY PRESS COMPANY
801 Woodswether Road Kansas City 6, Missouri

Enter 1075 on Reader Card

Hughes Tool forms section to enter quarry market

A NEW INDUSTRIAL SALES section has been formed by Hughes Tool Co., Houston, Tex., to exploit and distribute Hughes rock bits in mines and quarries doing blast-hole drilling.

Leon B. Stinson is manager of the new industrial sales section; he will be assisted by Roy M. Goolsbay. Mr. Stinson, a 21-year veteran with the company, was director of sales training. Mr. Goolsbay has been a special representative for sales to open-pit mine, quarry and construction blast-hole drilling, and in seismograph shot-hole drilling.

The same drill bits will be marketed to the rock industries as those which have made the firm the leading maker of oil-well drilling bits, the company announced. The firm first brought out the rotary rock bit in 1909, and developed the Aerobit, which uses air instead of water to remove cuttings. This is the preferred design in quarry work, and has been adopted by other bit makers.

Two sales managers

A. O. SMITH CORP., Kankakee, Ill., has announced the appointments of Roscoe R. Heard, Jr., who will direct industrial sales activities in New England, Middle Atlantic and Southeastern territories, and Clifford P. Sell, who has been assigned the Great Lakes area and the central states from Canada to the Gulf. Mr. Sell will operate out of Park Forest, Ill.

The company triggered this new sales program for Permaglas Mechanized Storage, and made the appointments to provide satisfactory service with expanding markets.

Hercules Powder tries making chemicals with nuclear energy

SCIENTISTS AT HERCULES POWDER Co., Wilmington, Del., believe they've found a way to produce chemicals by nuclear energy—and at costs competitive with conventional techniques. With patents pending in the U. S. and already received in Canada and Germany, the firm now is having the Atomic Energy Commission study the plan's feasibility, the Wall Street Journal reports.

The Brookhaven National Laboratory is studying the plan, which as yet is just a conceptual design and not a detailed engineering design. Hercules has researched the idea for 10 years, research director Dr. Robert W. Cairns

explained, studying the idea both at its own labs and in AEC reactors. Battelle Memorial Institute, Columbus, Ohio, also carried out an 18-month study in the project. AEC has been called in to establish the safety and probable cost of the idea, after which Hercules hopes AEC will build a prototype reactor. Estimated cost: $15 to $20 million.

Shovel firm not sold

BAY CITY SHOVELS, INC., Bay City, Mich., announces that report of its sale to other interests which appeared in the January issue of ROCK PRODUCTS is without foundation and entirely erroneous. The firm which manufactures excavating and material handling equipment continues under the same ownership and management.

Neptune Meter promotions

WENTWORTH SMITH is new marketing vice president of the Neptune Meter Co., and John J. Carroll is new general manager of the Liquid Meter Division. In his new post, Mr. Smith's primary concern will be long-range marketing plans and objectives for the firm's three divisions—Liquid Meter, Superior Meter (gas meters), and Electronic (measurement and control instruments). The Liquid Meter Division reportedly is the world's largest producer of liquid meters.

Mr. Carroll, as vice president and general manager of the Liquid Meter Division, will be in charge of all of its operations.

Sauerman Bros. is 50

SAUERMAN BROS., INC. of Chicago's suburban Bellwood tells of its 50 years of growth in making slackline cableway excavators in an anniversary brochure. Describing both the firm's history and products, the booklet emphasizes product applications in the gravel and other industries.

Used particularly in recovering gravel in deep underwater pits, the excavators range in size from small units to one big unit with 12-cu. yd. bucket which digs and hauls 720 tph. of sand and gravel. Popularity of the units has grown because their very low labor requirements (usually only one man) mean very low per-ton cost.

The company also supplies cable-suspended units for storage and reclamation operations, engineering and construction.

Fairbanks, Morse names division managers

FAIRBANKS, MORSE & CO. has named Gordon R. Anderson vice president and general manager of the Beloit Division (compressors, diesel engines, locomotives), and Frederick C. Johnson as vice president and general manager of the Scale Division. The firm recently was reorganized into four operating divisions, of which these are two.

With the company since 1922, Mr. Anderson has, since 1932, been successively chief electrical engineer, Beloit manager of engineering, general manager of the Freeport Works and then of several other divisions, and then chief engineer and vice president-engineering. Mr. Johnson, a graduate mechanical engineer, switched to F-M's sales staff from field engineer after serving in World War II. He has been Fair Lawn branch manager since 1954.

END

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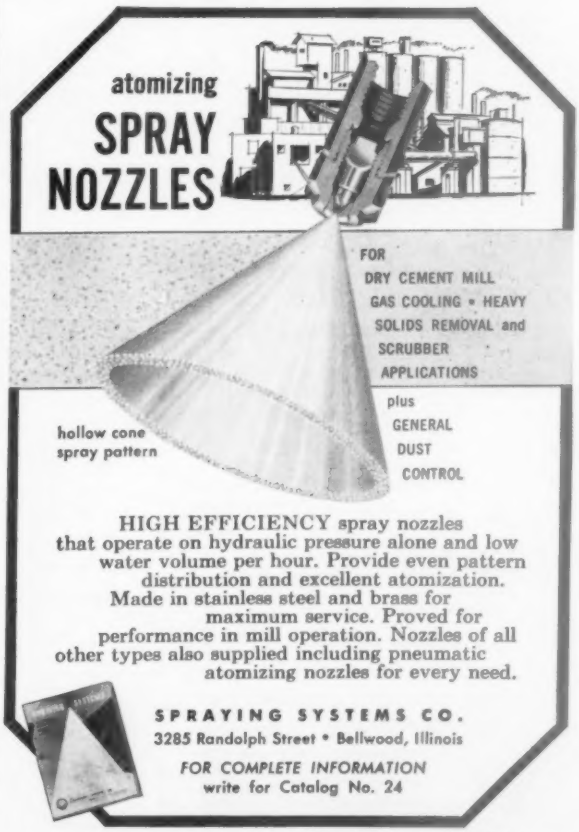
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14"	58'	2222	1159	$16.84
14"	85'	3377	1748	
16"	20'	1262	667	
16"	45'	2137	1118	
16"	60'	2662	1388	18.04
16"	90'	3712	1930	
18"	25'	1477	797	
18"	45'	2217	1182	
18"	70'	3142	1663	
18"	85'	3697	1952	19.24
18"	100'	4252	2240	
18"	130'	5362	2817	
20"	25'	1517	835	
20"	60'	2882	1548	
20"	75'	3467	1854	20.37
20"	90'	4052	2159	
24"	25'	1590	898	
24"	45'	2430	1334	
24"	70'	3480	1878	
24"	100'	4740	2532	21.78
24"	120'	5580	2967	
24"	150'	6840	3621	
30"	50'	2911	1617	
30"	70'	3871	2112	24.75
30"	90'	4831	2607	
36"	25'	1818	1118	
36"	45'	2858	1677	
36"	60'	3638	2096	27.95
36"	100'	5718	3214	

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For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

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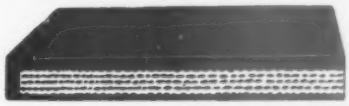

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14"	4	$3.78 ft.	$2.94 ft.
16"	4	4.24 ft.	3.09 ft.
18"	4	4.69 ft.	3.42 ft.
20"	4	5.17 ft.	3.95 ft.
24"	4	6.08 ft.	4.43 ft.
30"	4	7.47 ft.	5.42 ft.
36"	4	8.85 ft.	6.43 ft.

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A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

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16"	4	5.04 ft.	3.60 ft.
18"	4	5.61 ft.	3.98 ft.
20"	4	6.14 ft.	4.54 ft.
24"	4	7.22 ft.	5.14 ft.
30"	4	8.87 ft.	6.31 ft.
36"	4	10.49 ft.	7.64 ft.
24"	5	8.47 ft.	6.01 ft.

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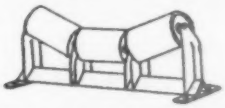

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1—Raymond 30" dia. Whizzer Separator.
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1—Fuller-Kinyon Conveying System type H257, 100 HP.
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GYRATORY: Al-Chal 6, 7½, 8, 9, 10, 12, 16, 18, 20". Telsmith TY 4', 3' Gyrosphere
25B Kennedy Van Saun 13, 37½, 39, 49½"
ROLL: Cedar Rapids 40x20, Pioneer 40x22, 30x18, 54x24 triple roll; Telsmith 24x16. Universal 13x16
HAMMERMILL: Jeffrey Type B3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x24, Stedman 24x30, 36", 42". Cedar-Rapids 50-50, 30x33, 30x42.
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AUTOCLAVES: J&C 6'6"x58' Quick Acting; 6'x50'
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KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 11'x155' Vulcan 9x100, 10'6"x105', 8'x124', 4'x90', 5'x72'.
DRYERS: 6'x80', 8'x72', 5'x24', 4'6"x32', 3'6"x20', 6'x20', 5'x35', 6'x24', 6'x40'.
COMPEB MILLS: A-C 7'x24', Patterson 7x18.
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___Buckets
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___Trucks, Bulk Cement
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___Trucks, Mixer Body
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INDIA

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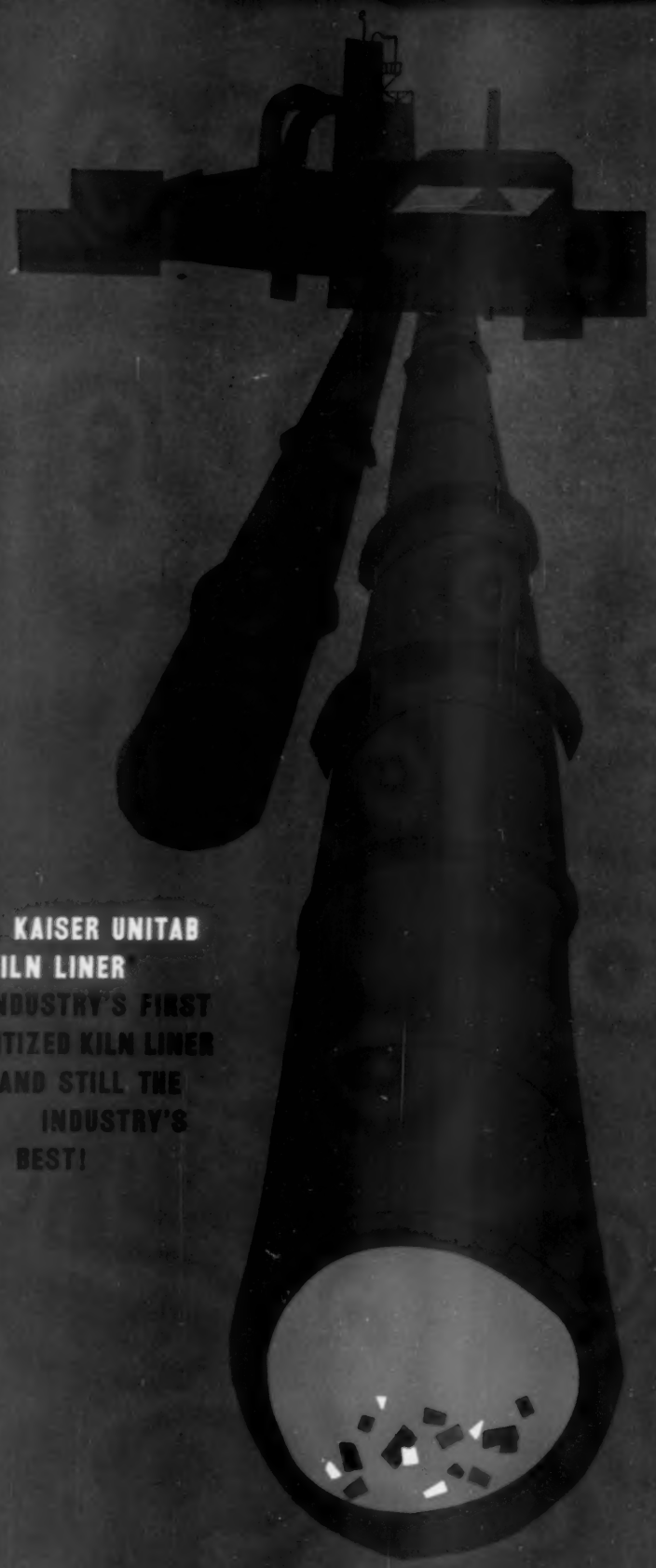

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